THE IRON TRADE REVIEW

VOLUME XXXVIII CLEVELAND, OHIO, JUNE 1, 1095 NUMBER 22

BRIGHT PROSPECTS

FOR PEACE AND PROSPERITY IN THE FAR EAST

And for Heavy Demand for Materials—The Week in Iron Circles.

War has been uppermost in the minds of men this week and whether honoring the memory of the heroes of the civil conflict or eagerly reading the accounts of one of the greatest naval battles of the world's history, conditions have not been favorable for calm consideration of the markets, but there is much reason for hoping that peace will soon be declared in the far East and that as the smoke of battle disappears, an era of progress and prosperity will there be inaugurated. The benefits of such a change can not fail to be felt in the United States, for, unless all indications are misleading, the demand for materials not merely for battleships and guns, but also for countless implements of peace will be very great.

A cablegram from the Japanese war department at Tokio orders the delivery by an Eastern Pennsylvania company of 1,000 trucks and other railroad supplies to be shipped to Port Arthur for use by Oyama's army in equipping the Manchurian Railway. The order was placed tentatively months ago, its consummation depending on the result of Togo's meeting with Rojestvensky.

The leading features of the markets have been continued dullness in pig iron, with Northern irons firmer than those of the South; prices on finished material well maintained as a rule with a strong demand for plates and merchant pipe; and a slight improvement in the demand for scrap. It does not seem probable that the United States Steel Corporation will buy Bessemer iron from the merchant furnaces for June delivery.

While there is almost no buying of Northern pig iron, sellers are not disposed to make concessions and $15.50 for No. 2 foundry is the ruling quotation. There are indications of improvement in the foundry business in the Central West and many sellers expect a heavy buying movement within 30 days. Southern iron is, however, weaker and the few buyers in the market have little difficulty in placing their orders at $12.50, Birmingham, for No. 2. There have been very few transactions in basic or Bessemer, which are nominally $15.50, furnace. Inquiries for basic and malleable at Cleveland are for a considerable tonnage. The steel corporation now has seven furnaces out of blast and several more stacks have been blown out by independent interests.

At a meeting of furnace men of Eastern Pennsylvania and New Jersey, there was a very optimistic sentiment, there being orders for 450,000 tons on the books, with urgent demand for prompt deliveries.

The delivery of steel has been checked already by the approaching shutting down of sheet and tin plate mills, shipments of sheet and tin bars having been practically discontinued to these finishing mills, which are now working up material on hand preparatory to shutting down early this month, one plant at South Sharon having already shut down ten mills.

The rail tonnage for this year now amounts to about 1,600,000, and in spite of recent newspaper announcements, the $28 price on standard sections will continue through the year and the apportionment of tonnage decided upon for 1905 remains unchanged. Rail sales for the week included 16,000 tons to the Erie, M. K. & T., 6,000; Louisville and Arkansas, 50,000; Marquette & Southeastern, 3,500. Recent contracts for large lake vessels have increased the orders for plates and the largest producer has allowed some orders to go to other interests. Merchant pipe is strong and independent producers are not making such low quotations. Competition in sheets continues strong, some independents having cut as much as $4 below the announced quotations. Competition for unusually desirable business has resulted in 1.45c being done at Chicago on bar iron, but this was exceptional and not indicative of the market, which ranges from 1.50c to 1.60c at the mills according to local conditions. The conference on the iron wage scale will be held at Detroit June 5, but no date has been fixed for the conference of sheet and tin plate manufacturers with the Amalgamated Association.

While there has been a very heavy movement of ore during the past month, rains have interfered with mining operations to such an extent that it is not probable that the large estimates of shipments for May made early in the month will be fulfilled.

There are some indications that the prolonged depression in scrap will not continue, but prices show little change.

Among recent heavy orders were for 167 miles of line pipe and casing for Texas, Kansas and Washington, taken by a Youngstown company and an order for 20,000 truck bolsters placed by the B. & O. R. R., representing in money the largest order ever given to one concern for bolsters.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
521 PARK BUILDING, May 30.

There is much speculation in iron circles this week as to the probabilities of the United States Steel Corporation purchasing Bessemer from merchant furnaces in the Valleys for June delivery. No decision has yet been reached, but from what can be learned from reliable sources, no iron will be purchased, nor is it probable that any will be re-

quired for July delivery. In the meantime the merchant stacks are stocking their Bessemer and basic and it is estimated that their stocks today aggregate 50,000 tons. Prices of steel making iron are merely nominal at $15.50, furnace, but there is little doubt that $15 could be done on a desirable tonnage. On No. 2 foundry iron the open quotation is $15.50, and this can be shaded from 10 to 15 cents a ton. Despite the improvement in the foundry trade in this district, consumers of foundry iron continue to cover immediate requirements only and the sales are hardly sufficient to establish a market. There has been considerable buying of charcoal iron, the Carnegie Steel Co. having taken the year's output of a Virginia furnace amounting to about 3,000 tons, while local roll makers have taken approximately 2,000 tons during the week.

The improvement noted in merchant pipe last week continues, and the largest producer now has a larger tonnage booked than at any time this year. The sheet and tin plate market continues weak. The leading interest has already shut down half the mills of the South Sharon tin plate plant and the remainder will go off in about a week. There will be a further shutting down of both sheet and tin mills during the month of June, and the indications are that by July 1, half the sheet and tin plate capacity of the country will be idle. The tremendous production in these lines the first half of this year has had much to do with bringing about this condition, and while the consumption has broken all previous records, jobbers and consumers generally overestimated the probable consumption, and overbought. On sheets as low as 2.30c is now being done on occasional carload lots for 28 gauge, while on tin plate concessions of 5 to 10 cents a box are being made.

Reports of an open market on standard section rails are denied. Prices will remain $28 until the end of the year and the apportionment of the tonnage will continue the same as it has been since Jan. 1. The total rail tonnage thus far this year now totals about 1,600,000, considerably lower than last year's bookings at this time. However, the supplementary buying of the railroads, which has already begun, will materially add to the year's total and while the production is not expected to equal that of last year, due also to some extent to the loss of the Canadian trade, the rail makers believe it will be satisfactory. The leading interest is now practically filled on plates to the end of the year and the bulk of the business now offered is being turned over to outside mills. The remaining plate mills in this district are booked from two to three months and on Bessemer plates shipments cannot be promised in less than four to six weeks.

The blowing out of blast furnaces is now becoming more of a factor in the situation from week to week. The steel corporation now has seven stacks idle while two merchant furnaces are out—one in Western New York and the other at Lowellville, O. Two Western Pennsylvania merchant furnaces are scheduled to blow out in June for relining and additional Valley furnaces are figuring on repairs. Production is thus being stringently curtailed and the ultimate effect on the pig iron market will be to strengthen the situation, if the present rate of consumption continues.

Pig Iron.—There are hardly enough transacations to establish a market for any of the Northern grades. Both Bessemer and basic are nominally $15.50, furnace, but $15 would no doubt be done on a desirable tonnage. On No. 2 foundry the furnaces are openly quoting $15.50 and this could no doubt be shaded 10 to 15 cents on actual transactions of any magnitude. There is no buying of Southern iron which is nominally held at $13, Birmingham for No. 2, but this price could be readily shaded 25 cents a ton and on a large tonnage $12.50 could be done. We revise quotations as follows:

Bessemer, Valley	$15 00 to 15 50
Bessemer, Pittsburg	15 85 to 16 35
No. 1 Foundry	16 75 to 17 00
No. 2 Foundry	16 25 to 16 35
Gray Forge, Pittsburg	15 25 to 15 40
Basic, Valley	15 00 to 15 50
Basic, Pittsburg	15 85 to 16 35

Steel.—The market is easier and Bessemer billets are quoted at $23 and open-hearth $24. Open-hearth sheet bars are quoted at $25, while Bessemer can be had at $24. The rod market is quiet and Bessemer and open-hearth are quoted at $34 to $35.

Ferro-Manganese.—Foreign ferro, 80 percent, is slightly easier and is quoted at $49 to $51 in carload lots, f. o. b. Pittsburg.

Muck Bar.—We note the sale of 1,000 tons of neutral bars at $27.35, Pittsburg, for June delivery.

Skelp.—The market is quiet and grooved steel is quoted at 1.50c to 1.55c and sheared 1.60c; grooved iron 1.65c and sheared 1.70c to 1.75c.

Rails and Track Material.—There will be no open market on rails this year. The price for standard sections will remain at $28 and the apportionment of the tonnage among the mills will remain as decided upon early in the year. The total tonnage booked by the mills this year now aggregates 1,600,000 tons, but with tonnage now in sight it is probable that the bookings will reach 2,000,000 tons before the end of July. The market on light rails continues quiet and few of the rerolling mills are in operation. We quote as follows: Fifty lb. and over 500 tons, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16 lb., $26; 20 lb., $25; 25 to 45 lb., $23; angle bars for standard sections, 1.25c; spikes 1.70c.

Plates.—The leading producer is now turning away orders on plates and this business is now going to outside mills. Of course the contract specifications are being taken care of, but the new business that is offered is going to outside producers. The situation is stronger now than at any time this year and there is no indication that there will be a falling off in demand in the immediate future. Quotations remain unchanged as follows: Tank plates, 1¼ in. thick, 6¼ in. to 14 in., inclusive, 1.50c f. o. b. mill Pittsburg; over 14 in. up to 100 in., 1.60c. Extras are as follows per lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c; locomotive fire box, 50c; plates over 100 in. up to 110 in. width, not less than 5c per lb. extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, $2 extra; gauges 7 and 8, $3 extra; No. 9, $5 extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except the Pacific Coast.

Bars.—Outside of occasional orders to cover immediate requirements, there is little buying of either iron or steel bars. The large agricultural interests will hardly come into the market before July for their requirements for the last half of the year, and the crop situation will then almost entirely govern their purchases. It is probable that they will be permitted to contract at prices lower than those now prevailing, although no official action has yet been taken by the steel bar producers. Iron bars are quiet and weak. We quote: Bar iron, 1.50c to 1.55c Pittsburg; hoops, 1.65c, and bands, 1.50c, both taking bar extras. Bessemer steel bars, 1.50c; open-hearth steel bars 1.50c; plow and cultivator, 1.50c, net; channels, angles, zees, and tees, under 3 in., 1.65c. The following differentials are maintained on steel: Less than 2,000 lb. of a size and not less than 1,000 lbs., 10 cents advanced; less than 1,000 lb. of a size, 30 cents advanced.

Structural Material.—All of the local structural mills are

from three to four months behind on deliveries of certain small sizes that enter largely into steel car construction, while on the larger shapes deliveries cannot be promised in less than 60 days. The situation in shapes is now practically assured until the end of the year on account of the recent large railroad orders that have been placed. Quotations are unchanged as follows: Beams and channels up to 15 in., 1.60c; over 15 in., 1.70c; angles, 3 x 2 up to 6 x 6, 1.60c; zees, 1.50c; tees, 1.65c; angles, from 3 to 16 in., 1.60c; universal and sheared plates, 6¼ to 14 in., inclusive, 1.50c; over 14 in., 1.60c base.

Sheets.—The sheet market is weak and black sheets, one pass, in carload lots can now be had at 2.30c in carload lots. Of course jobbers and consumers who contracted in November and December are securing their material at prices ranging from 2.10c to 2.15c. We quote black sheets in carloads as follows: No. 30, 2.70c to 2.80c; No. 29, 2.60c to 2.70c; No. 28, 2.30c to 2.40c; No. 27, 2.20c to 2.30c; Nos. 25-26, 2.20c to 2.25c; Nos. 23-24, 2.15c to 2.20c; Nos. 18-20, 2.10c to 2.15c; No. 16, 2.10c; Nos. 12-14, 2.05c; No. 9, 2c; No. 8, 1.95c; Galvanized, No. 30, 4.35c; No. 29, 3.85c; No. 28, 3.45c; No. 27, 3.25c; Nos. 25-26, 3.05c; Nos. 23-24, 2.85c; Nos. 18-20, 2.70c; No. 16, 2.55c.

Pipe and Tubes.—The improvement in merchant pipe continues, and while there is still some shading, the independent producers have withdrawn some of the low quotations that prevailed ten days ago. Discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination according to Tube Rate Book, are as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	67	51	65	49
⅜ to 6 inches	75	65	73½	63½
⅜ and ½ inch	71	59	69	57
7 to 12 inches	70	55	68½	53
Extra Strong Plain Ends.				
⅛ to ¼ inch	60	48	58	46
⅜ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong plain ends, ½ to 8 inches	56	45	54	43

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1¼ inches	44	41
1 ¼ to 2¼ inches	56	41
2½ inches	58	46
2¾ to 5 inches	64	53
6 to 13 inches	56	41

Less than carloads 2 points less.

Wire and Wire Nails.—Jobbers report a heavier movement of nails and wire than at any time this year and the belated spring demand has at last materialized. While the prices established with the last advance are not being secured, the recent understanding among the producers is preventing the shading of 1.75c as a basis. We quote: Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, and less than carloads, $1.95; painted barb wire, $1.95 for jobbers in carloads; retailers' carloads, $2, and less than carloads, $2.10, with 30c for galvanizing. Annealed smooth fence wire is held at $1.65, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten days. Iron cut nails are held at $1.85 Pittsburg, and steel at $1.75.

Merchant Steel.—Demand is not as heavy as earlier in the year and in few lines somewhat lower prices are being made. Demand for shafting is good in view of the small amount of new building that is being carried on throughout the country. We quote: Cold rolled and ground shafting, 50 percent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.70c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.70c to 1.75c; toe calk, 2c to 2.05c.

Old Material.—A slight improvement is reported in old material, but low prices continue to be made. The buying that is being done is still at a low basis and until the steel mills again enter the market there is little probability of any decided improvement. We quote, gross tons, as follows: Heavy smelting stock, $14.50 to $15; cast scrap, $14.75 to $15; sheet scrap, $13.50 to $14; cast borings, $9.50 to $10; No. 1 wrought, $16.75 to $17.

Coke.—Prices on foundry coke are easier and strictly Connellsville grades can be purchased at $2.40 to $2.50. The foundries are covering immediate requirements only and are awaiting lower prices before covering for the last half. Furnace coke for prompt shipment is held at $1.80 to $1.90. The production of the Connellsville region still continues at about 350,000 tons weekly, but as soon as the shutting down of furnaces is felt, there will be a distinct reduction in the output. During the week ending May 20, the upper region produced 269,021 tons and the lower 83,120 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, May 30.

There is a better feeling in those lines that have suffered from the recent depression. Demand for them has increased and prices are firmer. The inquiry is not of large proportions, but the improvement is there nevertheless. Whether it was created by sentiment or actual business, or whether it is the result of holding a mirror to other markets, which comes nearer being the real cause in this instance, the change has proved sufficient to raise the hopes of the most pessimistic seller. In the slight rift that has come, he sees the beginning of a buying movement and the passing of the old conditions. Local stacks have, however, reduced their prices, and those with iron to sell are offering it at $17 Chicago for No. 2 foundry. The slump in scrap has been halted, and prices, though no higher, are stronger. Bar iron touched the lowest level in months last week, being quoted at 1.45c, but quickly rebounded from this figure. This price was made to close up an order of several thousand tons offered by a car builder, to secure which there was considerable competition among local mills. The market is now 1.55c for carload lots, and 1.50c for larger quantities. The weakness in sheets appears also to have started on the vanishing path. Prices on light black and galvanized gauges are still shaded, but not to the same extent as formerly. There is no change in wrought pipe, and it is still possible to buy below the prices of the leading producer. On all heavy materials, including plates, structural shapes, steel bars, rails, etc., the market is easier. Premiums are occasionally obtained for quick deliveries, but these instances are not so numerous as formerly. All the mills have specifications in hand for several months' work and the lull is welcomed as an opportunity to catch up on delinquent deliveries.

Pig Iron.—Sales in the week under review were limited to carload lots with an occasional order for 100 tons interspersed. The market is now firmly established at $17 Chicago for Northern No. 2 iron. Greater interest was manifested in pig iron last week by western foundrymen than for some time, a number of whom did a little shopping in the hope of breaking down present schedules. So far as can be learned, all these efforts failed, the enquirers discovering instead an unlooked for strength in the situation. The net result is an improved tone to the market and revived hopes. We quote Chicago prices as follows:

Lake Superior charcoal	17 50 to 18 00
Northern Foundry No. 1	17 50 to 17 75
Northern Foundry No. 2	17 00 to 17 25
Northern Foundry No. 3	16 50 to 16 75
Northern Scotch Foundry	17 50 to 17 75
Ohio Strong Softeners No. 1	19 30 to 19 80
Ohio Strong Softeners No. 2	18 30 to 18 80
Southern Foundry No. 1	17 15 to 17 40
Southern Foundry No. 2	16 65 to 16 90
Southern Foundry No. 3	16 15 to 16 40
Southern Foundry No. 4	15 90 to 16 15

Southern No. 1 Soft	17 15 to 17 40
Southern No. 2 Soft	16 65 to 16 90
Southern Gray Forge	15 90 to 16 15
Southern Mottled	15 90 to 16 15
Southern Silveries (4% to 6% Silicon)	17 65 to 18 65
Jackson Co. Silveries (6% to 8% Silicon)	20 30 to 21 30
Jackson Co. Silveries (8% to 10% Silicon)	21 30 to 22 30
Alabama and Georgia Car Wheel	20 65
Malleable Bessemer	17 00 to 17 50
Basic Iron	16 65 to 17 15

Billets.—There is a fair enquiry for forging billets, for which local mills are getting good prices. Other grades of intermediate steel are quiet. We quote open-hearth forging billets, $31 to $32 Chicago; Bessemer rerolling, $28; sheet bars, $29.50; Bessemer wire rods, $34 Pittsburg; chain rods, $35 Pittsburg.

Bars.—There was active competition last week for an order of several thousand tons of bar iron offered by a western car builder. The specification was a very desirable one, and prices were cut liberally to secure it. It is stated that 1.45c took the order, although other reports are to the effect that a lower figure was made. The transaction has had no effect on the market, prices having jumped immediately after it was closed to their former basis. Carload lots are now quoted at 1.55c Chicago, and larger quantities at 1.50c. Specifications for steel bars continue without diminution, all the mills being sold months ahead. There has been some new business, but not of large enough proportions to cause comment. Prices are without change, and we quote carload lots, mill shipments, Chicago delivery, as follows: Bessemer and open-hearth bars and bands, 1.66½c base, half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 1.81½c base, full extras. Store trade is active and prices are firm. We quote bar iron, 1.90c base, full extras; soft steel bars and bands, 1.85c to 1.95c base, full extras; soft steel angles, channels and tees, under 3 in., 1.95c to 2.05c; hoops, 2.20c base, full extras.

Sheets.—All that can be said with regard to this product is that demand shows an improvement and prices are correspondingly firmer. Some independent mills, however, short of tonnage on the lighter gauges of black sheets, are making special prices to secure desirable specifications. Beyond this, only the rebate made by the leading producer is met. The situation does not warrant any change in our prices, and we quote carload lots, mill shipments, Chicago delivery, as follows: Blue annealed sheets, Nos. 9 and 10, 1.76½c to 1.81½c; Nos. 11 and 12, 1.81½c to 1.86½c; Nos. 13 and 14, 1.86½c to 1.91½c; Nos. 15 and 16, 1.96½c to 2.01½c. On box annealed, one pass cold rolled, we quote Nos. 18 and 20, 2.21½c to 2.26½c; Nos. 22 and 24, 2.26½c to 2.31½c; Nos. 25 and 26, 2.31½c to 2.36½c; No. 27, 2.36½c to 2.41½c; No. 28, 2.46½c to 2.51½c; No. 29, 2.56½c to 2.61½c; No. 30, 2.66½c to 2.71½c. We quote on lots from warehouse stocks as follows: No. 10, 2.10c to 2.15c; No. 12, 2.15c to 2.20c; No. 14, 2.20c to 2.25c; No. 16, 2.30c to 2.35c; Nos. 18 and 20, 2.50c to 2.55c; Nos. 22 and 24, 2.55c to 2.60c; No. 26, 2.70c to 2.75c; No. 27, 2.75c to 2.85c; No. 28, 2.85c to 2.95c; No. 29, 3c to 3.05c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12 and 14, 2.56½c; No. 16, 2.71½c; Nos. 18 and 21, 2.86½c; Nos. 22 and 24, 3.01½c; No. 26, 3.21½c; No. 27, 3.41½c; No. 28, 3.61½c; No. 29, 3.86½c. Jobbers' prices on lots from store have also been revised, and are now as follows: Nos. 10 to 14, inclusive, 3.10c; No. 16, 3c; Nos. 18 and 20, 3.10c; Nos. 22 and 24, 3.25c; No. 26, 3.50c; No. 27, 3.70c; No. 28, 3.95c; No. 29, 4.40c; No. 30, 4.85c.

Structural Steel.—Mills continue to book further new tonnage for as quick deliveries as can be given. Specifications are heavy, notably those from car builders, one received last week being for 5,000 tons. Premiums are cheerfully paid for quick deliveries of medium sized angles and channels. We quote mill shipments, Chicago delivery, as follows: Beams and channels, 3 to 15 in., inclusive, 1.76½c; angles, 3 to 6 in., ¼ in. and heavier, 1.76½c; angles larger than 6 in., on one or both legs, 1.86½c; beams larger than 15 in., 1.86½c; zees, 3 in. and over, 1.76½c; tees, 3 in. and over, 1.86½c; with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. We quote prices from store as follows: 2.10c to 2.25c for angles, beams and channels, base sizes, with 2.20c to 2.30c for 18, 20 and 24-in. beams; tees and zees, 2.15c to 2.25c. These prices are for either random lengths or cut to specifications in excess of 5 ft.

Plates.—Large specifications have been placed with the leading producer in the week under review by Cleveland shipbuilding interests. The jobbing trade in this city has fallen off to some extent, due, it is thought, to the approach of warm weather. We quote carload lots, mill shipments, Chicago delivery, as follows: Tank steel, ¼ in. and heavier, 6⅛ in. to 100 in., 1.76½c base; flange steel, 1.86½c base; marine steel, 1.96½c base, all full extras. Plates, 3-16 in. thick, $2 extras; gauges 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Store quotations are as follows: Tank steel, ¼ in. and heavier, up to and including 72 in. wide, 2c; over 72 in. wide up to 100 in., 2.10c; over 100 in. wide, usual mill extras, 3-16 in. up to but not including 72 in. wide, 2.10c; 3-16 in., 72 in. wide, 2.35c; flange steel, 25c extra; heads, 25c extra.

Rails and Track Supplies.—Orders for several thousand tons of standard sections were closed last week. Specifications from both steam and electrical roads are to the full allotment of contracts. Light rails are active and prices firm. We quote heavy sections in 500-ton lots and over, f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12-lb. sections, $27; 16-lb., $26; 20 and 25-lb., $25; 30, 35, 40 and 45-lb. sections, $24, all f. o. b. Milwaukee mill. Track supplies, f. o. b. Joliet mill. Angle bars, 1.40c to 1.50c; spikes, first quality, 1.75c to 1.80c; track bolts, 3¼ x ¾, with square nuts, 2.40c to 2.50c per lb., with hexagon nuts, 2.55c to 2.65c.

Merchant Pipe.—There is no change from the condition reported a week ago. Independent makers of pipe are still naming prices below those of the leading producer. Demand is better than a week ago. With the above reservation, we quote "official" prices, carload lots, f. o. b. Chicago, random lengths, as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¼ inches	65.85	49.85	63.85	47.85
⅜ to ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	72.35	62.35
7 to 12 inches	68.85	53.85	67.35	51.85

PLUGGED AND REAMED.

	Steel.		Iron.	
1 to 4 inches	71.35	61.35	69.85	59.85

EXTRA STRONG PIPE.

⅛ to ⅜ inches	58.85	46.85	56.85	44.85
½ to 4 inches	65.85	53.85	63.85	51.85
4½ to 8 inches	61.85	49.85	59.85	47.85

DOUBLE EXTRA STRONG PIPE.

½ to 8 inches	54.85	43.85	52.85	41.85

Boiler Tubes.—There is an active demand for pipe of all sizes, mills being unable to keep up with their orders. Prices are firm. We quote carload lots, mill shipments, Chicago delivery, as follows:

BOILER TUBES.

	Steel.	Iron.	Seamless.
1 to 1¼ inches	40.35	37.35	53.00
1¼ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	
			Up to 4½ inches 50.50
6 to 13 inches	52.35	37.35	

Less than carload lots from store, as follows:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches, inclusive	40	35	42½
1¼ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	30
2¾ to 5 inches, inclusive	60	47½	42½
6 inches and larger	50	35	

Merchant Steel.—Aside from the continued good volume of specifications, there is little to report. All products are in healthy demand, supplementary orders having been received from a number of implement manufacturing sources. Prices are without change and we quote carload lots, mill shipments,

Chicago delivery, as follows: Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c; smooth finished machinery steel, 1.91½c; smooth finished tire, 1.86½c; plow steel, 2.20c and upward, according to quality; toe calk steel, 2.21½c. Cold rolled shafting, 50 percent off in carload lots and 45 percent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and upwards.

Cast Iron Pipe.—Routine orders are of good volume, the aggregate tonnage making a good showing. Prices are firm, carload lots, Chicago delivery, being quoted as follows: 4 in., $29; 6 in. and larger, $28; gas pipe, $1 a ton higher.

Wire Products.—Mills report a falling off in business as the hot weather approaches. This is not unusual at this time of the year, and causes no particular comment. Prices are strong. We quote to jobbers on carload lots, Chicago delivery, as follows: Wire nails, $1.95; painted barb wire, $2.10; galvanized barb wire, $2.40; smooth annealed wire, $1.80; smooth galvanized wire, $2.10; polished staples, $2.05; galvanized staples, $2.35. Less than carload lots to jobbers are 5 cents higher than above prices. The retail trade is quoted 5 cents extra over the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½ and 5 percent and 85 percent discount f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet and DeKalb, with actual freight allowed not exceeding 30 cents per 100 lb.

Foundry Coke.—Demand for coke is light, local foundries covering their wants at low prices by the purchase of demurrage fuel. Standard 72-hour Connellsville brands are offered at $2.25 ovens or $4.90 Chicago for immediate shipment. For long time deliveries, 25 cents a ton more is asked. Virginia and West Virginia brands range from $2.35 to $2.50 at the ovens. Wise County, Va., coke is offered on the same basis (Chicago delivery) as Connellsville cokes.

Old Material.—A noticeable improvement is apparent in the local scrap market. The downward progress of prices has been halted, and bottom has been touched at least for awhile. Trading is quiet, though some large transactions are pending. The following are approximate prices asked by local dealers:

Old steel rails (4 feet and over)	$14 50 to 15 00
Old steel rails (less than 4 feet)	13 50 to 14 00
Old iron rails	19 00 to 19 50
Relaying rails, subject to inspection	22 00 to 22 50
Old wheels	14 50 to 15 00
Heavy melting steel	12 00 to 12 50
Mixed country steel	9 00 to 9 50

The following quotations are for net tons:

No. 1 R. R. wrought	14 00 to 14 50
No. 2 R. R. wrought	13 00 to 13 50
Shafting	15 00 to 15 50
Dealers' forge, No. 1	11 00 to 11 50
Wrought pipe and flues	9 50 to 10 00
No. 1 cast, 150 lb. and less	13 00 to 13 50
No. 1 mill	9 00 to 9 50
No. 1 Busheling	9 50 to 10 00
No. 2 Busheling	8 50 to 9 00
Country sheet	7 50 to 8 00
No. 1 boilers, cut	9 00 to 9 50
Boiler punchings	12 50 to 13 00
Iron car axles	20 50 to 21 00
Steel car axles	15 00 to 16 00
Iron axle turnings	10 00 to 10 50
Cast borings	7 00 to 7 50
Mixed borings, etc.	7 00 to 7 50
Machine shop turnings	9 50 to 10 00
Railroad malleable	12 50 to 13 00
Agricultural malleable	11 50 to 12 00
Stove plate and light cast scrap	9 50 to 10 00
Old iron splice bars	17 00 to 17 50

The Milwaukee Coke & Gas Co., Milwaukee, Wis., announces that it has appointed Pickands, Brown & Co., Chicago, exclusive selling agents for the Milwaukee Solvay foundry coke in Chicago and immediate territory.

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, May 31.

There has been a very heavy movement of ore from upper lake ports this month, but the total will not be as large as was estimated two or three weeks ago on account of heavy rains which have interfered with mining operations. On account of the small amount of coal which has been shipped, vessels have often been compelled to go up light and ore has been almost their sole reliance for earnings.

Pig Iron.—The foundry business is showing improvement, especially in heavy castings, for which the demand has been limited. One large engine builder in the Mahoning Valley has been unable to do all its own foundry work and has contracted for parts of it. The same is true of a large Milwaukee concern, for which work is being done in this city.

The demand for pig iron is very light and while $16 at furnace has been paid for small lots of No. 2 foundry, the usual quotation is $15.50 for a fair sized order. Southern could be bought at $12.50, but there is little inquiry for it. There has been encouraging inquiry for basic and malleable, one buyer desiring from 6,000 to 10,000 for the second half. We quote f. o. b. Cleveland as follows:

Bessemer	$15 85 to 16 35
No. 1 Foundry	16 75 to 17 00
No. 2 Foundry	16 25 to 16 50
No. 3 Foundry	15 75 to 16 00
No. 2 Southern	16 35 to 16 85
Gray Forge	15 25 to 15 40
Gray Forge, Southern	15 00 to 15 35
Lake Superior charcoal	17 50 to 18 00

Finished Material.—Orders for about 12,000 tons of shapes and plates for new vessels have been placed with the principal producer and about 8,000 to 10,000 more tons will be required for vessels already ordered. Fortunately for the mills, delivery will not be required for many months. Bar iron is firm in this city at 1.55c to 1.60c in spite of reports of sales as low as 1.45c in other markets.

Jobbers say that, on the whole, their business is good, but in some lines, notably boiler tubes and shafting, very little is being done.

Independent makers of sheets are freely quoting low prices, as low as $4 below the following quotations being named. We quote prices for delivery in Cleveland, adding 9½c freight from Pittsburg: Mill sales of black sheets in carload lots, No. 10, 1.89½c; Nos. 11-12, 1.94½c; No. 14, 2.04½c; No. 16, 2.09½c; No. 27, 2.49½c; No. 28, 2.59½c. Galvanized mill sales, No. 14, 2.64½c; No. 16, 2.74½c; Nos. 18-20, 2.89½c; Nos. 22-24, 3.04½c; Nos. 25-26, 3.24½c; No. 27, 3.44½c; No. 28, 3.64½c. Out of stock, black sheets, ¼ in., 1.95c; 3-16 in., 2.05c. Blue annealed, No. 10, 2.15c; No. 12, 2.20c; No. 14, 2.25c; No. 16, 2.35c. One pass cold rolled, Nos. 18-20, 2.40c; Nos. 22-24, 2.45c; No. 26, 2.50c; No. 27, 2.55c; No. 28, 2.65c; No. 30, 3.05c. Galvanized out of stock, No. 16, 2.80c; Nos. 18-20, 2.90c; Nos. 22-24, 3.05c; No. 26, 3.25c; No. 27, 3.45c; No. 28, 3.65c; No. 30, 4.45c.

Old Material.—Dealers in scrap express the conviction that the decline of the past four weeks has reached the bottom and that there will now be a gradual rise. Existing contracts have for the most part expired and buying for the next quarter is expected to help prices. We quote gross tons, Cleveland delivery, as follows:

Old iron rails	$20 00 to 21 00
Old steel rails (over 6 feet)	14 50 to 15 50
Old steel rails (under 6 feet)	14 50 to 15 50
Old car wheels	14 00 to 14 50
Steel boiler plate	10 00 to 11 00
Steel axles	15 50 to 16 50
Malleable iron (railroad)	15 00 to 16 00
Malleable iron (agricultural)	13 00 to 14 00
Heavy steel	13 50 to 14 50

We quote as follows, net tons:

No. 1 R. R. wrought	14 00 to 15 00
No. 1 busheling	12 00 to 13 00
No. 1 machine cast	12 50 to 13 00
Iron axles	21 00 to 22 00
Axle turnings	10 00 to 11 00
Wrought turnings (free from cast)	9 00 to 10 00
Grate bars	8 00 to 9 00
Pipes and flues	10 00 to 11 00
Tank iron	9 00 to 10 00
Hoop and band iron	7 50 to 8 50
Sheet iron	6 50 to 7 50
Wrought drillings	9 00 to 10 00
Stove plate	8 50 to 9 00
Cast borings	6 50 to 7 50

CINCINNATI.

May 30.

Pig Iron.—The feature of the market the past week has been the lowering of quotations. We learn of one sale of 1,000 tons to a large consumer for prompt shipment at $11.75 Birmingham for No. 4 foundry, which is regarded as on the basis of $12.50 for No. 2 foundry. An inquiry for 500 tons of No. 2 soft from a central Ohio concern, for quick shipment, has brought out quotations of $12.50 of this grade and that price may now be said to be practically an open quotation. In connection with the inquiry for 500 tons it has been learned that this does not indicate that the consumer has worked out his contracts, as a cancellation order for an equivalent tonnage was received by a Cincinnati concern because of inability to deliver this amount of iron. The order being sixty days over due, the buyer exercised his right to cancel the contract in order to replace the order at a lower price. It is proper to comment on this feature of the transaction as the selling interests are naturally anxious to note all contracts that have been worked out and are watching for fresh buying. The order has not yet been placed for this tonnage and it is not known at what price the iron will be obtained, but it is known that $12.50 Birmingham has been quoted. It has been tacitly understood for more than a week that any inquiry that might come out would draw this quotation or a lower one. In a general way, there has been no change so far as demand is concerned and dullness is still continued. Furnaces are now piling iron and under lack of orders are anxious for business, but recognize the futility of trying to induce buying by offering iron at concessions. Northern furnaces located in central and southern Ohio are reported to be maintaining $15.50 for No. 2 foundry at furnace as a minimum, but no business has been offered to serve as a test for actual prices. The feeling in the market is still weak and the trade does not look for steadier or firmer sentiment until buying is actually resumed. The few small inquiries now coming in cover only small lots for quick shipment and buyers are not expected to cover their second half requirements until more settled conditions become evident. We quote the market as follows f. o. b. Cincinnati:

Southern Foundry No. 1	$15 75 to 16 25
Southern Foundry No. 2	15 25 to 15 75
Southern Foundry No. 3	14 75 to 15 25
Southern Foundry No. 4	14 50 to 14 75
Southern Foundry No. 1, soft	15 75 to 16 25
Southern Foundry No. 2, soft	15 25 to 15 75
Gray Forge	14 25 to 14 50
Northern Foundry No. 1	17 15 to 17 40
Northern Foundry No. 2	16 65 to 16 90
Northern Foundry No. 3	16 15 to 16 40
Southern Charcoal	19 25 to 19 50

Coke.—The coke market, like the pig iron market, is dull and easy with quotations on foundry coke ranging from $2.25 to $2.50 f. o. b. ovens, and furnace coke from $1.75 to $2 at ovens. But few contracts are being placed and inquiries are mainly for comparatively small lots.

Finished Material.—The demand continues active for all articles in the steel list and jobbers are still unable to get satisfactory deliveries from the mills and the fact that the mills are behind on orders makes the jobbing trade active from parties needing quick delivery. The bar iron trade is quiet with an easy undertone in sympathy with pig iron. Bar iron is quoted at 1.55c to 1.60c; steel bars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets at 75 and 7½ percent off. We quote black sheets, No. 27, at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are firm and sell out of store at 2c for ¼ in. and 2.10c for 3-16, No. 8 and No. 10. Beams and channels are quoted at 2c from stock and angles at 2c to 2.05c for base sizes.

In merchant pipe the leading interest is adhering to the schedule, but independents are reported to be competing for orders on some sizes, but prices are not importantly disturbed. We quote f. o. b. Cincinnati:

MERCHANT PIPE.
(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛ and ¼ inches	65.35	49.35	63.35	47.35
⅜ and ½ inches	69.35	57.35	67.35	55.35
¾ to 6 inches	73.35	63.35	75.85	61.85
7 to 12 inches	68.35	53.35	66.85	51.35

Old Material—The market continues weak with dealers anxious for business and quotations are irregular and difficult to quote. Last week's figures are nominally unchanged. We quote:

Old No. 1 railroad wrought, net tons	$14 00 to 15 00
Cast machine and foundry, net tons	11 00 to 12 00
Old iron rails, gross tons	19 00 to 19 50
Old steel rails, gross tons	15 00 to 15 50
Old short lengths, gross tons	13 50 to 14 00
Old iron axles, net tons	20 00 to 21 00
Stove plate, net tons	8 50 to 9 00
Wrought turnings, net tons	10 00 to 10 50
Cast borings, net tons	7 00 to 7 50
Car wheels, net tons	15 00 to 15 50

PHILADELPHIA.

May 30.

Little change is to be noted during the past week, but sentiment may be said to be a trifle less pessimistic than it was a fortnight or so ago. It is generally recognized that the market is in a state of equipoise, where comparatively little in the way of bad news would be needed to depress pig iron prices still further, while a continuance of favorable conditions, with good crops and general prosperity assured, would doubtless mean a small advance. As the developments during June will do much to fix the character of the market during the rest of the year, there is a general disposition among producers to assume a conservative attitude for the time and to exert whatever influence they can toward bettering the situation. These remarks apply, of course, to the pig iron interests. The mills have little or no cause for complaint, as those engaged in the heavier lines of steel have orders up to their full capacity for many weeks ahead, and the others are moderately busy.

Pig Iron.—Those who attended the meeting here last week of the furnacemen of Eastern Pennsylvania and New Jersey declare that the feeling was most hopeful and the sentiment decidedly cheerful. A comparison of business conditions showed orders on the books for 450,000 tons, an unusually large amount, and an urgent demand for prompt deliveries. No accumulation of stocks was reported, except a little off iron, and this was not regarded as serious. No furnace in this territory has as yet closed for repairs, and the production continues at top notch. Business continues very quiet, but small orders, calling for prompt delivery, dribble in, and an occasional order larger. One for 4,000 tons of basic iron was placed last week at a figure not made public. There is a disposition to shade prices, however, when that is necessary to secure a good sale, and this sagging tendency is expected before long to bring buyers into the market, as no marked reduction from present figures is looked for. Prices may be quoted as follows:

No. 1X Foundry	$18 00 to 18 25
No. 2X Foundry	17 25 to 17 50
No. 2 Plain	16 50 to 16 75
Standard Gray Forge	15 50 to 15 75
Ordinary Gray Forge	14 75 to 15 00
Basic	16 25 to 16 50
Low phosphorus	20 50 to 21 00

Finished Material.—No let-up is reported from the mills in the demands for the heavier forms of steel, plates and structural material, but there is a noticeable easing up in the orders for sheets, pipe iron and tubing. The reduction in the price of scrap is expected to stimulate the demand for bar iron, which continues fair. Prices remain unchanged from the schedule: Beams, channels and angles,

according to specifications, 1.73½c to 1.85c; refined iron bars, 1.73½c to 1.80c; steel bars, 1.63½c to 1.70c; plates, 1.73½c to 1.80c.

Old Material.—A trifle more activity is reported in the scrap market, but it seems to have been at the expense of prices, which have now reached a point where they are soon expected to bring the mills back as buyers. There is very little doing, however, scarcely enough to fix the range of prices. These may be quoted as follows:

Old steel rails	$15 75 to 16 25
No. 1 steel scrap	15 75 to 16 25
Old steel axles	20 00 to 21 00
Old iron axles	23 00 to 23 50
Old iron rails	20 00 to 20 50
Old car wheels	15 00 to 16 00
Choice scrap, R. R. No. 1 wrought	18 50 to 19 00
No. 1 yard scrap	16 50 to 17 00
Machinery scrap	15 00 to 15 50
Low phosphorus scrap	21 50 to 22 00
Wrought iron pipe	14 50 to 15 00
No. 1 forge fire scrap	14 00 to 14 50
No. 2 forge fire scrap, ordinary	10 00 to 11 00
Wrought turnings	12 50 to 13 00
Axle turnings, heavy	14 00 to 14 50
Cast borings	9 50 to 10 00
Stove plates	10 00 to 10 50

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., May 30.

Pig Iron.—It was a waiting market in all that the term implies during the past week. From the standpoint of business, prices received no test at all, and while no changes occurred, a different report would have been possible had buyers been more in evidence. There were very few orders placed, and where any were, prompt shipment was requested, showing that only those who have immediate requirements to meet are in the market. Eastern Pennsylvania furnaces booked orders at $16 at the furnaces for No. 2 foundry, but found very little demand for their product. In Southern irons $13 continues to be the prevailing rate for No. 2 foundry at Birmingham, but there is no doubt whatever that a round lot could be had for 50 cents per ton cheaper. Buyers have practically everything their own way, and being convinced that production is greater than consumption, and knowing the willingness of furnaces to take orders at present prices for the remainder of the year, are confident that developments of the near future will be in their favor. Quite a number of furnace interests are allowing the market to take its own course. There are some good inquiries going the rounds, but they bear many appearances of being "feelers." New York quotations at tide-water follow: Northern No. 1 foundry, $17 to $17.50; No. 2 foundry, $16.50 to $17; No. 2 plain, $16 to $16.50; No. 1 Southern foundry, $17 to $17.50; No. 2 foundry, $16.50 to $17; No. 3 foundry, $16 to $16.50; No. 4 foundry, $15.50 to $16. Foundry pig iron warrants follow:

	Bid.	Asked.
June	$15 25	$15 75
July	15 20	15 60
October	15 20	15 60
February	15 40	15 75

Finished Iron and Steel.—Business in structural shapes during the past week continued to be excellent. While we hear of no large contracts having been taken, we know there are several which are practically closed, definite announcement of which can be expected any day. In small lots conditions could not be much better, and orders of this character make up a large tonnage. In plates the demand remains good, with quick delivery being sought, but cannot be obtained. In sheets and bars only a normal trade has been done. We quote New York prices at tide-water: Angles, 3 to 6 in. x ¼ in. and heavier, 1.74½c; beams, 3 to 15 in., 1.74½c; channels, 3 to 15 in., 174½; beams, 18, 20 and 24 in., 1.84½c; tees, 3 x ¼ in. and heavier, 1.79½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine and ordinary firebox, 1.94½c; refined iron bars, 1.64½c; soft steel bars, 1.64½c to 1.67c; sheets, in carload lots, New York, No. 28, black, 2.50c to 2.55c; galvanized, 3.60c to 3.70c.

Old Material.—Trading in the local market during the past week was exceedingly light, and prices remained unchanged. There is plenty of material waiting for a market, but the holders of it, are convinced that present conditions are against them and are not forcing the situation. Quotations approximately f. o. b. New York follow:

Old iron rails	$20 00 to 22 00
Old steel rails, long lengths	15 50 to 16 50
Old steel rails, short pieces	14 50 to 15 00
Relaying rails	20 00 to 21 00
Old car wheels	15 50 to 16 50
Old iron car axles	21 75 to 22 75
Old steel car axles	18 00 to 19 00
Heavy melting steel scrap	14 50 to 15 50
No. 1 railroad wrought scrap	18 75 to 19 50
Iron track scrap	17 00 to 18 00
Wrought pipe	13 50 to 14 50
Ordinary light iron	9 50 to 10 50
Cast borings	8 00 to 8 50
Wrought turnings	11 50 to 12 50
No. 1 machinery cast	14 50 to 15 25
Stove plate	12 00 to 13 00

BIRMINGHAM.

May 30.

Announcement is made in Birmingham that there has been an improvement in the pig iron market. The demand has picked up some, while inquiries show that purchasers are about to enter the market and a large quantity of iron is going to be needed to fill orders. J. C. Maben, president of the Sloss-Sheffield Steel & Iron Co., is authority for the statement that a better feeling has developed and that all indications point to a general revival of the buying movement.

The furnacemen in this district are sanguine that the dullness is not to be long lived and the slight improvement noted the first of the week is most encouraging. There is a large production of iron in this district, in fact there is more iron being manufactured in Alabama right now than for more than fourteen months. The Tennessee Coal, Iron & Railroad Co. last week started up the Little Belle furnace again at Bessemer. The new furnace, No. 6 at Ensley, which was put in operation just a few weeks since, on Friday last broke a record as to production. The usual production is about 250 tons of iron. On the date mentioned the output amounted to 366 tons. It is not intended to make effort to keep up this production as the strain would be damaging to the iron-maker. However, the daily output will be around the 250 tons mark, which makes this furnace the largest in the district. The furnaces in blast are doing exceptionally well, the production being steady. There has been an accumulation in this district but not enough to cause alarm.

Said a prominent iron man: "The largest production in the history of iron making took place during April when more than two million tons of iron were manufactured. The records show that the accumulation amounted to but 17,000 tons. If the consumption continues, there are no reasons to have fears as to the future. There are furnaces being blown out in the North, either for repairs or under agreement to curtail the production in order to regulate the market."

In the Southern territory there appears to be no inclination to enter into an agreement looking to a curtailment of the production. There will be a steady operation of furnaces. Labor is a little scarce around the furnaces, and much trouble is being experienced to hold that labor which has been at work for some time. For this reason the Woodward Iron Co. may be delayed in working all three of their furnaces steadily, the new iron-maker in particular.

Positively no change in conditions are to be noted at the steel plants. The indications point to a record breaking month at the Ensley plant of the Tennessee Coal, Iron & Railroad Co. The steel rail being manufactured at Ensley is still being delivered to Southern railroads. The open hearth furnace being built in the steel plant at Ensley is fast near-

ing completion and by Fall will be in full operation. As stated before, this furnace will have a larger capacity than any of the ten open hearth furnaces which have been in operation.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., May 30.

Pig Tin.—While prices show no change from those of a week ago, dullness continues to be just as characteristic of the market. Consumers are buying on the hand-to-mouth plan, and believe that lower prices are imminent. In London the market has been fairly active, with prices unchanged on futures, but slightly higher on spots. Today's closings follow: Spot and May, 29⅞ to 30¼c; June, 29¾ to 30⅛c; July, 29½ to 30c. London's closings today follow: Spot, £136 15s; futures, £136. Arrivals at Atlantic ports for the month aggregate 2,056 tons with 2,605 tons afloat.

Copper.—The local market suffered no change in prices during the past week, but trade conditions are still unsatisfactory, with nothing indicating improvement in the near future. The London market was somewhat active, with prices slightly higher on spot, and unchanged on futures. Today's closings follow: Lake and electrolytic, 15c nominal; casting, 14¾c nominal. London's closings today follow: Spot, £64 17s 6d; futures, £65. Exports for the month were 20,449 tons.

Lead.—Is quiet and unchanged, spot being 4.50 to 4.60c. St. Louis remains at 4.40c. London continues £12 17s 6d.

Spelter.—There has been a futher decline in prices. Spot and May are 5.40 to 5.50c and June, 5.35 to 5.45c. St. Louis is lower at 5.10 to 5.20c. London remains at £23 12s 6d.

Antimony.—This metal continues strong, Cookson's being 8⅞ to 9⅛c, Hallet's 8⅞ to 9¼c, and other grades 8½ to 9c.

Quicksilver.—We quote $38 per flask of 75 lb. lots of 100 flasks. London is £7 7s 6d.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, May 30.

Metals continue weak and prices have a fluctuating tendency. Pig tin and spelter each dropped half a cent during the week. We quote as follows: Lake copper, 15c for carload lots, and 15¼c for less than carload lots. Casting copper, 14⅞c for carload lots, and 15c for less than carload lots. Spelter, 5.50c for carload lots, and 6c for lesser quantities. Sheet zinc is without change at 7¼c for carload lots of 600-lb. casks, and 7½c for less than carload lots. Pig tin, 30c for carload lots, and 30¼c for less than carload lots. Pig lead, 4.45c for 50-ton lots, 4.50c for carload lots and 4.55c for less than carload lots. Antimony, both Cookson's and Hallett's, is quoted at 9½c.

There is a fair amount of trading in old metals. Dealers' quotations are approximately as follows: Copper wire, 13c; heavy copper, 12c; light copper, 11c; red brass, 11c; red brass borings, 9c; yellow brass, 8c; yellow brass borings, 7c. Pipe lead, 4c. Tea lead, 3.60c. Zinc, 4.15c.

Chas. M. Schwab, in a recent interview said it was true that negotiations for control of the Tidewater Steel Co., by himself and other interests have been declared off and that there is no basis for the report that the Bethlehem Steel Co. is seeking to acquire an independent shipbuilding company.

It is reported that the Nordberg Mfg. Co., Milwaukee, has secured control of the Wm. Bayley & Sons plant, the latter company having been declared a bankrupt by the courts.

PERSONAL.

Chas. E. Pope, president of the Pope Tin Plate Co., Pittsburg, has returned from a long trip abroad.

President F. C. Smink, of the Reading Iron Co., has made the following appointments: J. M. Callen, assistant to the general manager; G. F. D. Hallman, purchasing agent; E. J. Mishler, assistant sales manager of the tube works sales depuartment.

H. J. Slifer, for several years general superintendent of the Chicago, Rock Island & Pacific railroad, has been engaged as steam railroad expert by J. G. White & Co., Inc., engineers and contractors, of New York and London.

W. D. Truesdale, formerly of Youngstown, O., but now of Birmingham, Ala., has been chosen auditor for the Tennessee Coal Iron & Railroad Co., succeeding L. Hoover, who has been appointed secretary-treasurer of the company.

I. A. Ryan has been selected by the Belfont Iron Works Co., Ironton, O., as successor to J. C. Maloney, who recently resigned as general superintendent of the company's wire mills. He has already assumed the duties of his new position. Mr. Maloney has moved to Atlanta.

J. A. Herrick, M. E., of Philadelphia, has arranged with the Whiting Foundry Equipment Co. of Harvey, Ill., for the sole manufacture of all his specialties for both the United States and Canada and will hereafter be associated with that company as consulting engineer. He will for the present be located as formerly at Philadelphia.

George K. Hamfeldt, superintendent of the Carrie furnaces of the Carnegie Steel Co., Pittsburg, who has tendered his resignation to take effect on June 1, was presented with a solid silver punch bowl by the employes of the plant last week.

Harry Richards, furnace foreman of the blast furnace of the Struthers Furnace Co., Struthers, O., has been appointed assistant general manager. His father, Allen Richards, is general manager of the plant.

Newton A. Hemphill has been elected vice president and general manager of the Carbon Steel Co., Pittsburg, to succeed J. W. Anderson, who lost his life in the Pennsylvania railroad wreck at Harrisburg, several weeks ago. James Johnson, assistant superintendent, was promoted to the position of superintendent and Frank Howland was elected secretary. A. H. Keith, of Pittsburg, was elected a member of the board of directors.

Fred A. Geier has been appointed by Mayor Fleischmann as member of the Board of Trustees of the University of Cincinnati to succeed Alfred Benedict, who resigned. The term will expire Jan. 1, 1910. Mr. Geier has been prominently identified with the manufacturing interests of Cincinnati for some years. He is president of the Cincinnati Milling Machine Co., director in the German National Bank, and interested in a number of other manufacturing enterprises. He has served as president of the Manufacturers' Club and as vice president of the Business Men's Club. Mr. Geier has for several years been prominent in the councils of the National Metal Trades Association, serving in the capacity of treasurer, and is now filling the office of first vice president of this organization. His appointment to the trusteeship of the university is in line with his present interest in educational matters, since he is now chairman of the Business Men's Club Public School Committee, and also a member of the Board of the Ohio Mechanics' Institute.

Major John M. Carson, for thirty years a Washington correspondent, has accepted appointment by President Roosevelt and Secretary Metcalf of the department of commerce and labor as commissioner of manufactures.

Charles C. Schnatterbeck, for many years on the editorial staff of the *Engineering and Mining Journal*, has accepted a position on the United States Geological Survey. His contributions on economic subjects bearing on the mining industry have been widely published.

The Labor Situation.

HEAVIER AMALGAMATED DUES.

To strengthen its almost depleted treasury, the Amalgamated Association of Iron, Steel & Tin Workers at the late Detroit convention adopted increased membership fees by which the annual income of the association will amount to about $60,000 annually. The scale of dues to be collected by the sub-lodges is as follows: Members earning $2.50 per day or less, 60 cents per month; over $2.50 and less than $5.00, 80 cents per month; $5.00 and upward, $1 per month. The sub-lodges remit $1 quarterly to the national organization for each member. To provide additional means to carry on strikes, a new clause was adopted providing for an extra assessment, which can be levied while any strike is pending. Assessments are to be levied as follows: ½ of 1 percent of the wages of the members at work when 500 or any fraction thereof over 100 are on a strike or locked out; 1 percent when 1,000 or more than 500 are out; 2 percent for 2,000, 3 percent for 3,000, 4 percent for 4,000 and 5 percent for 5,000.

WAGES INCREASED BY JONES & LAUGHLIN STEEL CO.

An increase in wages averaging from 7 to 10 percent has been granted all the employes of the Jones & Laughlin Steel Co., Pittsburg, at the South Side steel works and finishing departments, and at the Eliza and Soho furnace departments. The advance dates back two weeks and the first intimation the men had of the advance was when they received their pay on Saturday, May 27. It is probable that the wages of the coke workers and the coal miners employed by this company will be similarly advanced.

WAGE CONFERENCE AT DETROIT.

The conference to decide on the Western iron scale will be held between the Amalgamated Association of Iron, Steel & Tin Workers and the Republic Iron & Steel Co., at Detroit, on Monday, June 5. The Amalgamated Association will be represented by its puddling and finishing committee and President T. J. Shaffer and President-elect P. J. McArdle. The Republic Iron & Steel Co. will be represented by General Manager Charles Hart, of Youngstown. The scale decided upon during this conference will govern the independent iron mills as well as the Republic Iron & Steel Co. There will be little difficulty in adjusting the boiling scale on which an advance of only 2 percent is asked, but the advance of 13 percent asked by the finishers will hardly be granted. No date has yet been set for a conference on the sheet and tin plate scales, which will be held in June after the iron scale is adjusted.

METAL TRADES ASSOCIATION NOTES.

At a meeting of the St. Louis Metal Trades Association, held May 23, the St. Louis Metal Trades Association was merged into the National under the name of The St. Louis Branch of the National Metal Trades Association. The vote in favor of the merger was almost unanimous. The detail work of the individual members filing application for membership in the National Association is almost completed. More than 90 percent of the members have already filed such applications.

A meeting of the Philadelphia Metal Manufacturers' Association will be held at the Manufacturers' Club, on Tuesday, June 13, at 8 p. m. The secretary of the association claims that for the first time in many weeks his labor bureau's reports show more men laid off than hired.

The N. M. T. A. representative in charge of the strike of the Franklin Boiler Works of Troy, N. Y., reports that the shop has resumed business with practically a full quota of men.

W. P. Egan, commissioner of the National Metal Trades Association, who has been suffering from rheumatism for some time, is taking a course of treatment at Mt. Clemens, Mich. He is stopping at the Hotel Medea.

The strike of the Detroit Brass Molders, which several days ago promised to assume threatening proportions, has been abandoned and all shops are now running with a full quota of men.

From present indications the strike of the machinists in the employ of the Canada Foundry Co., of Toronto, will not be prolonged. The question at issue was whether the company should have the right to make individual contracts with its employees. The company did not insist on all of its employees entering into such contracts. The objection made to this procedure on the part of the company by the representatives of the labor organization was that such contract interfered with the union's power over its members who were employees of the company.

J. M. Manley, secretary of the Cincinnati Metal Trades Association, advises that members of his organization employing 1,573 operatives have signed a paper expressing their approval of the proposed merging of his association into the National.

Paul Blatchford, the secretary of the Chicago branch of the N. M. T. A., advises that he feels that his association is to be congratulated on being the first to become a branch of the National. By reason of that action, it is believed that several strikes have probably been prevented against firms who were members of the local association only.

J. W. Gardner, of the Gardner Governor Co., of Quincy, Ill., president of the N. M. T. A., is on an extended tour of the south and southwest.

Record Breaking Ore Cargo.

The new steamship E. H. Gary, launched a few weeks ago, took on a record breaking load of ore at Escanaba, May 30, loading 12,003 gross or 13,443 net tons, which will be taken to South Chicago. While loading, a leak developed and the vessel now has to carry 500 tons of water as well as her cargo. She is drawing 21 feet of water. The Gary is the first of four steamers building by the American Shipbuilding Co. for the Pittsburg Steamship Co. to come out. The boats are duplicates and are the largest freighters on the lakes, being nine feet longer than the Augustus B. Wolvin. The Gary is 569 ft. over all, 549 ft. keel, 56 ft. beam and 31 ft. deep.

The Oliver Iron Mining Co., of Duluth, Minn., which is constantly on the lookout for methods of improving the efficiency of its machinery, has arranged for having shipped to the Champion mine at Beacon, Michigan, parts for reconstructing the hoisting engine which it has had in operation there. This is a double machine and will be divided into two single engines. The work is to be done by the Allis-Chalmers Co., of Milwaukee, which will put the apparatus in shape to perform the kind of service best adapted to the present requirements of the mining company.

Wm. Bayley & Sons Co., Milwaukee, has been formally adjudged bankrupt in pursuance to the petition of the John Pritzlaff Hardware Co., the Northwestern Mfg. Co., and the Wisconsin Telephone Co., and has been ordered to file a schedule of its liabilities and assets with the court.

The directors of the American Car & Foundry Co. have declared a dividend of 1 1-6 percent on the preferred stock, payable July 1; instead of the quarterly dividend of 1¼ percent ordinarily payable Aug. 1, in order to make the dividend periods and the fiscal periods end at the same time.

The machine shops and roundhouse of the Pere Marquette Railroad were destroyed by fire May 22. Eight locomotives were also destroyed. The estimated loss is $80,000.

THE IRON TRADE REVIEW

Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

PUBLISHED EVERY THURSDAY BY

THE PENTON PUBLISHING CO.

CLEVELAND, OHIO.

CHICAGO - - - - - 1164 Monadnock Block.
PITTSBURG - - - - - - 429 Park Building.
NEW YORK - - - - - - - 150 Nassau St.

Subscription, $3.00 per annum. To Foreign Countries, $4.50.
Advertising Rates Furnished on Application.

Change of advertising copy must reach this office on Thursday preceding date of publication.

The Cleveland News Co., will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER

JUNE 1, 1905

A. I. FINDLEY.

With the present issue, Alvin I. Findley terminates his labors for THE IRON TRADE REVIEW and, today, assumes an editorial position of responsibility with our New York contemporary, the *Iron Age*. Mr. Findley became editor of THE IRON TRADE REVIEW in 1892. He bore the burden conscientiously and with skilful zest—from the early days of a one-man proposition to the later years of an enlarged and well-knit organization with its representatives in every large industrial center. Uniformly courteous, broad minded and large hearted, a keen student of current conditions affecting all our iron and steel interests, a journalist of practical acquaintance with every detail of magazine making, he leaves behind him a working force of energetic loyalty—a staff effective and sufficient. THE IRON TRADE REVIEW wishes Mr. Findley every success.

THE WORLD'S FUTURE SUPPLY OF IRON.

Every two years a new president of the Iron and Steel Institute is inducted to office. The presidential addresses delivered on such important occasions are naturally of a high order. No other occasion induces such a study and effort to present matter of vital interest to the iron trade of the world. On May 11 the new president, Mr. R. A. Hadfield, delivered an address which will even stand out from among other similar addresses, through its breadth of vision and accuracy of detail. It is really unfortunate that such an important occasion should call for a spoken address, since each address becomes a classic to be referred to in future years, yet in its preparation the requirements of a spoken address must be observed. One of the most important topics in Mr. Hadfield's address was the question of future supplies of iron ore for the rapidly growing iron trade of the world. In a work intended purely for the type Mr. Hadfield could, and doubtless would, have included more exact and comparable figures than were desirable for the address as it must be presented. He tells us that the known supplies of iron ore in the world are being rapidly exhausted, and that there is no good reason for assuming that the future will disclose other supplies, commensurate with the increasing consumption which is indicated.

With the prospective consumption of iron Mr. Hadfield is sufficiently concise. He assumes that the world's output of pig iron has already reached 50,000,000 tons per annum. The maximum has really been about 46,000,000 tons, in 1903. In 1904 it was about a million tons less. In 1900 it first passed the 40,000,000 ton mark. Then he points out that, at the rate of consumption in the United States and Great Britain, this is only enough iron for about one-eighth of the world's present population. Supposing that two-thirds of the world's population should reach the same rate of consumption, then 250,000,000 tons of pig iron annually would be required, still to be augmented by increases in the world's population and increases in the per capita consumption.

In the matter of ore consumption Mr. Hadfield takes a broad view. He assumes three tons of ore per ton of pig iron. In the United States the relation has always been less than two tons of ore to one of pig, while the latest summary of the British Board of Trade showed, for nine countries in 1903, a consumption of 957,157,000 tons of ore and a production of 45,735,252 tons of pig iron, which is only a trifle over two to one, without allowing anything for the appreciable quantities of iron ore which are used otherwise than in the manufacture of pig iron. However, it may not be so long until the world is driven to use ore of which three tons will be required to make a ton of pig.

In regard to the actual extent of present known deposits of iron ore Mr. Hadfield simply makes general quotations from a number of sources, which, however, show the inadequacy of such deposits to the indicated rate of expansion in demand. He dismisses the United States with a presentation of old estimates of the Lake Superior ore reserves, neglecting the much larger deposits in the Southern field, and other deposits. Regarding the Minette ores he merely mentions one estimate, which gives them a life of 800 years, based on present output, although a recent estimate by another authority places their probable life at 125 years.

In a presentation not intended for oral delivery more figures can be used, and the following table of the world's approximate pig iron production is therefore given:

1870	11,900,000.
1880	17,950,000.
1890	27,157,000
1900	40,100,000
1904	45,000,000.

Roughly, there is outlined here a doubling in production once every 15 or 20 years, and this rate continued would make, by 1950, the output of 250,000,000 tons annually which Mr. Hadfield assumed whenever two-thirds the world's population should have reached a per capita consumption equal to that of the United States and Great Britain. It is unlikely that the rate will so soon be reached; the world will not so soon be civilized, and all consumers cannot buy iron and steel as cheaply as those whose consumption has become so great.

The known deposits of iron ore in the United States amount to a few billion tons, not less than a billion, as Mr. Hadfield assumed. There may be a billion in the Lake Superior region. There is more than that in Alabama, and there are other deposits in other States. In the Cleveland district there may be five billion, including extremely low grade ores; only a small fraction of a billion is really high grade. The Minette district has been estimated to contain all the way from a couple of billion to dozens of times this amount. The Shansi district in China is expected to take a prominent place in the list of large deposits.

With a rate of pig iron production of 250,000,000 tons annually, which may not be reached in 1950, but should be reached within a century, there will be indicated a consumption of nearly a billion tons a year of ore, if low grade ore must be worked as expected. If the available deposits are reckoned merely by billions of tons, they will not last a great while. Mr. Hadfield was very conservative when he referred to the possibility of a deficiency "in 300 or 400 years."

The question, "Does this concern us of to-day?" Mr. Hadfield dismisses with the question, "What will then be said of us?" if the deficiency occurs.

Perhaps no more direct answer to the question of how this concerns the present generation can be given, from a British standpoint, but to us in America the question is much more pertinent. British iron masters have been withdrawing their profits almost as fast as made and investing them in land, or in fact anything but iron and steel plants. In the United States it is not only the custom for much of the profits to be reinvested, but we now have large corporations, with perpetual charters, issuing stocks for the retirement of which there is no provision, and bonds which run half a century or longer. It is desirable for manufacturers who do business on the American basis to look far into the future.

Then, again, the fiscal policy of a government which has maintained a high tariff during the whole development of its iron industry, and which hesitates, possibly, about its continuance, must have great regard for questions of the duration of its mineral supplies. It is easy to imagine that in less than half a century there may be more demand for export than for import duties. Conditions in England and the United States have been so different, as regards the iron industry, that there is much more reason for us to look into the future.

There is need for further study into the origin of iron deposits. Sir Robert Ball's theory is that the deposits are all meteoric. Accordingly they are, as observed, near the surface, and great hopes cannot be held for continued new discoveries. Professor S. Aurenius and others hold to a volcanic theory, and assert that a large proportion of the earth's interior may possibly, or even probably, be iron.

We do not know what is beneath the surface. The deepest shafts, at the Cape and in the Lake Superior copper region, are about a mile in depth; the deepest bore hole, in Silesia, is about the same depth. Greater depths could be penetrated, but it is to no one's individual interest to make the heavy expenditure. The information gained would be the property of the world. It has been estimated that a shaft 12 miles deep could be sunk for $25,000,000. No individual or corporation will pay the bill, but the world could well afford to. As society evolves the way will be opened for this and greater explorations. If the Aurenius theory be correct, then it is possible that such explorations may find iron, and it will be iron, and not oxide. We do not suggest that it may be tapped molten from the earth's interior, not desiring to digress too far from the interesting and really important subject which Mr. Hadfield has so properly broached.

REBUILDING PLANS

Of the National Tube Co.—Steel Pipe Only to be made at McKeesport.

The plans for rebuilding the National department of the National Tube Co., Pittsburg, located at McKeesport, Pa., provide for the removal of all the puddling and knobbling fires from this plant and their centralization at the Republic works on the South Side, Pittsburg. After these plans have been carried out, only steel pipe will be manufactured at McKeesport, and the new Lorain, O., plant is likewise only equipped for the manufacture of steel pipe, indicating a tremendous change in the consumption of steel over iron. The National department contains 20 charcoal knobbling fires, 2 refinery fires, 2 heating furnaces, 2 steam hammers, 6 double and 25 single puddling fires, 26 heating furnaces and sufficient rolling capacity to finish all the iron produced. The Republic Works on the South Side contain 26 single and 10 double puddling furnaces. Property has already been secured to provide room for this additional capacity, and when completed will be one of the largest iron pipe mills in the world. Work on the erection of the third blast furnace at McKeesport is progressing favorably and it is probable that it will be blown in before the end of the year.

The Whiting Foundry Equipment Co., of Harvey, Ill., Chicago suburb, has recently concluded arrangements with J. A. Herrick, M. E., of Philadelphia, Pa., whereby it becomes sole manufacturer of all his patented specialties in gas producer, furnaces, valves, annealers, etc., in the United States and also in the Dominion of Canada. The Whiting Company will add further facilities to its already large works and be prepared to furnish promptly complete equipment for steel works of all kinds, particularly steel castings, also for gas producers, regenerators, furnaces and other similar equipment for every purpose and for every kind of fuel.

STEEL CORPORATION CHANGES.

Greenville Plant Being Enlarged—Puddling Furnaces Will Be Rebuilt.

The 8 and 10-in. merchant mills of the Girard, O., plant of the Carnegie Steel Co. have been removed and are now being installed in the stock yard of the merchant mills of the company at Duquesne, Pa. At this plant there are two Morgan continuous merchant mills and the two smaller mills from Girard are being installed in the space between the two cooling beds which was formerly used for carrying stock. These smaller mills will be used for rolling odd sizes and small orders such as cannot be conveniently taken care of by the continuous mills. Additional stock bins are to be provided for carrying stock in this department and racks will be installed for carrying lots in tonnages for carload shipments. It is also probable that an additional standard gauge track will be laid to facilitate shipping and another crane may be added to handle the material from the mills now being installed. The mills will probably be placed in operation the latter part of August or early in September. With the removal of these mills the dismantling of the Girard mill is completed and the Warren, O., plant is likewise being dismantled. The Greenville, Pa., plant is being enlarged and the puddling furnaces are being rebuilt, while the Duncansville, Pa., plant is again in operation, despite reports that it is to be dismantled.

Large Orders for Pipe.

The Youngstown Sheet & Tube Co., Youngstown, O., has taken an order for 27 miles of 6-in. line pipe to be laid in Texas; 100 miles of pipe and casing for Kansas and 40 miles for Spokane, Wash.

The company's new lap weld furnace is now in operation, greatly increasing the capacity for producing line pipe, casing, etc.

New Railway Equipment.

Illinois Central will build 378 coal cars, 100,000 lb. capacity at the Burnside shops. Steel underframes for these have been ordered from the American Car & Foundry Co. Missouri Pacific railroad has ordered 2,000 gondola cars from the Western Steel Car & Foundry Co., 1,000 gondola cars and 1,000 box cars from the American Car & Foundry Co. The Nashville, Chattanooga & St. Louis railroad will build 100 drop bottom gondola cars at the Nashville shops. The Chicago, Burlington & Quincy road will order 2,000 box and 400 refrigerator cars. The Pere Marquette has ordered five Atlantic, 20 consolidation and 10 switch engines from the American Locomotive Co., for September 1905 delivery.

Rainey Coke Co. not Absorbed.

The persistent newspaper report that the Rainey Coke Co. has been or is about to be absorbed by the H. C. Finch Coke Co., or the property leased by the latter company is again officially denied. It is positively stated that no negotiations for such sale or lease are pending. Since the removal of the Cleveland offices of the Rainey company to New York, the city business is being looked after by J. W. Thompson, while Rogers, Brown & Co. will sell Rainey coke in the Cleveland district outside of the city.

E. J. Hess, of the Hess Spring & Axle Co., Carthage, O., has purchased all the assets of the Pontiac Axle Co., Pontiac, Mich., and a new company to be known as the Hess-Pontiac Spring & Axle Co., is now being incorporated. The company expects to have a strictly modern plant for the manufacture of vehicle springs and axles with an annual capacity of about 100,000 sets of each.

NEW CONSTRUCTION.

The National-Acme Mfg. Co., Cleveland, will shortly enlarge its manufacturing capacity by the addition of a four-story brick and steel extension to the main building. An improved market for "Acme Automatics" both at home and abroad, together with a greatly increased demand for set and cap screws, has made more room an urgent necessity, and building operations will commence as soon as the structural material can be secured.

The Simonds Mfg. Co., Fitchburg, Mass., saw maker, has closed contracts for the erection of three new buildings of the latest improved style of mill construction and protected from fire by automatic sprinklers. The buildings are to be completed ready for occupancy by Nov. 1.

The Bryant Steel Wheel & Rim Co., Columbus, O., is getting ready to occupy its own plant. Practically all the machinery is ready and the delay has been caused by its inability in getting in the new building.

Plans for the new plant of the Vulcan Iron Works Co., at Toledo, O., are now being drawn and the company expects to build this fall.

The Grand Rapids Foundry Co., Grand Rapids, Mich., is preparing to start the work on its new shop. The new building will be constructed of concrete blocks.

The Pittsburg & Lake Erie Railroad will shortly begin work on several new projects at McKees Rocks, Pa. One of the new projects is the construction of a large car repair shop, 412 x 415 ft. The Jones & Laughlin Steel Co. has been awarded the contract for the structural steel. A new car repair shop, a lumber storehouse and carpenter shop are included in the improvements.

The New York Central Iron Works, Geneva, N. Y., finds the steady growth of its business makes it necessary to find a site outside of the congested portion of the city. The capital stock will be increased from $100,000 to $300,000, and the plant greatly enlarged.

The F. E. Myers Pump Co., Ashland, O., has decided to erect a new brick building, 70 x 200 ft., and work will be started this summer.

The Commercial Improvement Co., Ft. Wayne, Wis., reports that it has succeeded in securing the Ft. Wayne Iron & Steel Works and the Knott-Van Arnam factory in that city, and extensive arrangements have been made to give them proper facilities.

The Toronto Gas & Gasoline Engine Co., Toronto, will build a one-story concrete machine shop to cost $17,000, and the Pease Foundry Co., Ltd., of the same city, will build a $25,000 structure, brick and galvanized iron. Building permits have already been taken.

The Baltimore Bridge Co., Baltimore, Md., has prepared plans for the erection of a big boiler shop, 90 x 200 ft., to cost $11,000.

The Atlanta Iron & Brass Bed Co., Atlanta, Ga., recently incorporated, has completed its organization with John L. Coleman, president; W. R. Ware, vice president; N. T. Sprate, secretary. A two-story building, 100 x 200 ft., is being erected.

The Allis-Chalmers Co., Milwaukee, is planning the erection of a new electrical department, and is securing information from all sections of the country on building and equipment of electrical manufacturing plants.

A twelve-ring plant at Conneaut, equipped with twelve two-ton Hulett buckets and Andrews electric winch scrapers, during the past two weeks on the steamer Christopher unloaded 5,647 gross tons at the rate of 1,284 gross tons per hour for the plant of twelve machines. On the steamer J. C. Gilchrist a record of 6,455 gross tons at the rate of 1,368 gross tons per hour for the twelve machines was made at the same plant.

LAKE SUPERIOR IRON MINES.

Serious Caves at the Malta—Options taken for Explorations.

The Jones & Laughlin Steel Co. has let a contract to E. Gannon for engine and boiler houses, etc., at the rolling mill mine, Negaunee, and he has begun work. A new office has just been built and occupied by the company at that location. This company has decided not to take up some Vermillion range prospects that it has been looking over, but will confine its attention to its present mines. Supt. Thos. Walters is authority for the statement that the company now has sufficient iron ore in the Mesabi and Marquette ranges to last it, at the present rate of consumption, for the next forty years, and it feels quite independent in the matter of supplies.

There have been several serious caves at the Malta mine in the past few weeks, and the railway tracks of roads there have suffered severely. The company has shipped its stockpile and its shovel has been moved to the Sparta, which is close by and under the same management. Neither mine will be a large shipper, as Mesabi tonnages go, but each will be better than for some time past, probably better than any preceding year.

The Duluth & Iron Range road has installed the block system of train handling on its hill above Two Harbors with eight signal stations about three miles apart. The road has leased eight heavy locomotives from the Northern Pacific for service until the close of the busy season, and until the wheat season begins on the other road.

Porter Bros., who have stripping contracts at mines of the Mesabi range, have several steam shovels at work on the canal of the Great Northern Power Co., near Duluth, and are rapidly removing earth. They also have channeling machines at work taking out rock, and will have the canal completed this year. They expect additional work on the company's dams, etc., that will maintain their operations for some time longer. Everything in connection with this power plant is moving fast and all contracts for the completed work, up to a power of 30,000 h. p. have been let and are under construction.

The suit of owners of the farms the Cleveland Cliffs Iron Co. bought for its Maas mine, to secure title to a portion of the land, virtually to obtain from the company a bonus, has been appealed from the circuit court and comes up soon in the state supreme court. The company won easily in the lower court, and there seems no reason to doubt that it will do so in the higher court. There are several hundred thousand dollars of improvements on the strip sought by these complainants, including the Maas shaft.

B. W. Vallet, mining engineer for the Interstate Mining Co., of Virginia, Minn., has gone to Sunrise, Wyo., where he has a corresponding position with the Colorado Fuel & Iron Co., vice R. H. Ahbe, who has returned to Duluth, Minn. O. M. Johnson, from Ishpeming, has taken Mr. Vallet's place with the Interstate Mining Co.

Mine valuations in Iron county, Mich., have been fixed by the assessors as follows: Crystal Falls city, $518,000; Crystal Falls town, $332,000; Mansfield town, $92,000; Hematite town, $97,000; Stambaugh, $249,000; Iron River town, $32,000. These are subject to changes by the board of review, but the changes are not likely to be important and the valuations are about the same as last year.

Explorers have taken options on lands belonging to the Canal company south of the old Dunn mine and will explore there as they consider the indications favorable for the presence of iron. There is considerable work under way in that part of the Menominee range and it is almost certain that something of value will be proved by some of them.

Toledo parties are exploring for ore within about six miles of Marquette, half way to Ishpeming, These properties have been looked over before and some work has been done in that vicinity, but not for many years, and no thorough exploration has ever taken place there. It is thought that with careful work by skilled men it will be possible to make some interesting showing, that may lead to important developments.

IMPORTS AND EXPORTS FOR APRIL.

The Department of Commerce and Labor statistics on imports and exports of iron and steel show a marked decrease of imports for the ten months ending with April, 1905, and an equally marked increase in exports for the same period as compared with ten months ending April, 1904.

EXPORTS OF IRON AND STEEL FROM THE UNITED STATES—GROSS TONS.

	April		10 mos. end'g Apr.	
	1904	1905	1904	1905
Pig iron	2,808	3,869	29,945	42,534
Scrap	1,444	827	12,454	18,146
Bar iron	3,391	4,119	17,410	27,890
Wire rods	870	1,670	12,382	14,812
Steel bars	4,145	1,857	15,211	21,108
Billets, ingots and blooms	28,276	19,111	113,366	208,853
Hoop, band or scroll iron	309	125	2,419	2,668
Iron rails	208	128	1,317	78
Steel rails	10,460	22,549	68,045	372,380
Iron sheets and plates	517	426	4,499	3,873
Steel sheets and plates	3,257	8,101	14,285	86,768
Tin plates, terne plates and taggers' tin	1,382	2,961	2,003	8,402
Structural material	3,854	9,634	25,648	61,570
Wire	11,549	12,910	92,922	99,421
Cut nails	798	965	7,845	6,826
Wire nails	2,765	2,990	27,444	29,501
Other nails, including tacks	244	313	2,045	3,145
Total	75,414	102,645	577,075	978,025

While for a period of ten months the decrease in imports was 216,378 gross tons in 1905 as compared with last year the month of April 1905, showed an increase of but 562 gross tons. The exports increased 400,950 gross tons for 10 months ending April, 1905, as compared with the same period, 1904.

IMPORTS OF IRON AND STEEL TO THE UNITED STATES—GROSS TONS.

	April		10 mos. ending Apr.	
	1904	1905	1904	1905
Pig iron	7,713	11,514	181,899	81,028
Scrap	1,291	328	24,996	9,184
Bar iron	1,289	3,157	26,741	20,800
Iron and steel rails	3,903	139	37,632	8,496
Hoop, band or scroll	204	.....	1,709	1,585
Steel ingots, slabs, billets or bars	998	659	90,757	7,707
Sheets and plates	379	57	9,825	1,718
Tin and terne plates	6,363	6,751	43,114	61,252
Wire rods	1,519	1,595	15,754	12,323
Wire and wire articles	310	294	4,325	3,118
Structural shapes	258	235	13,229	2,375
Total	24,167	24,727	425,984	209,586

Obituary.

Daniel J. Bassett, superintendent of the Risdon Iron Works, San Francisco, died at his home last week after an illness of six weeks. He was 45 years old, a native of San Francisco and entered in the employ of the Risdon Iron Works as an apprentice in 1877, was promoted to various positions of responsibility until he reached the superintendency, in which position he gained the confidence and esteem of his employes and those who came in contact with him as patrons of the institution.

Isaac Wardwell, for 50 years associated with George Waring in the foundry business and later organizer of the Stamford Foundry Co., died at his home in Stamford, Conn., May 20. He was born in 1815.

The Electric Safety Brake Co., of Cincinnati, has leased from the Cincinnati Traction Co. for a term of five years the building at the corner of Knowlton and Langland streets, adjoining the Cumminsville power house. The building contains 15,000 feet of floor space, and will be equipped with modern machinery adopted to the needs of the brake company.

THE EASTERN MACHINERY MARKET.

The machinery market in this vicinity during May admits of a better report than April. The business closed was not only larger in point of volume, but covered a greater number of branches. Not in some time did small orders abound to such a plentiful extent, and they came in so steadily that good monthly totals resulted.

Perhaps there was no branch of the trade in which there were a greater number of hopeful developments than machine tools. All along merchants have been building their hopes of a good year on the bright prospects which railroad specifications held out, but not until the past few weeks did any substantial evidence for their confidence manifest itself. At this writing there are more railroad lists in the market, specifying a larger number of tools, than we have been able to chronicle in many months. The railroads represented in them are the Pennsylvania, Erie, Norfolk and Western, and New York Central. Just what the totals comprise is difficult to ascertain, but when what is definitely known is added to that which seems likely, it is not far short of $2,000,000, while in some quarters this is regarded as too conservatively estimated. A goodly part of these propositions looks well for crystalizing into orders at an early date, but there is always a possibility of the buying being done on the piecemeal plan. The demand for machine tools from miscellaneous sources has been very good also. The inquiries received, and these have been very numerous, make it almost certain that the summer will be characterized by some good business. Prices are without change, and while there are always a few who assert that concessions are being made, we have not heard any talk to that effect recently. Deliveries are fairly good, but in lathes and milling machines the most complaint about belated shipments is heard.

In power equipment May has shown a distinct improvement over the previous month. In fact more healthful conditions made their appearance than could be noted for any month of the present year. The contracts taken did not involve any large horse power engines, but were made up mostly of 200 to 400 horse power. Quite a few of the orders related to items that have been hanging fire for months. Inquiries showed a decided improvement. This was a feature that was very pleasing to manufacturers, as they have been finding fault with the backward aspect of them for several months past. Prices show a little firmer tendency, and it is harder now to get concessions from representative concerns than it was several weeks ago. In boilers there was a change for the better also, the orders taken and the business in prospect, being much more encouraging than for the month previous.

In electrical equipment May was marked by much more favorable developments than April. As previous reports noted, the delays that have taken place in new construction have played havoc with manufacturers, so far as orders were concerned, but during the past month orders came in with a frequency that indicated that plain sailing was a little more in evidence. There were no contracts of any magnitude taken, current business being made up of from small to medium orders. Less was heard of price cutting also.

In power transmitting machinery general conditions were good, both orders and inquiries showing up better than in April. The woodworking machinery line was more active during the month than it was the month previous. In machinists, engineers, contracts, and railway supplies, business for May was reported to have been satisfactory, with the outlook suggestive of increasing trade in the near future.

All that can be said of the export machinery trade during May is that it continued to be good, with the outlook better than it has been for months.

The Niles-Bement-Pond Co. found May a satisfactory month. The orders while mostly confined to small lots, made up an excellent monthly total, inquiries showed a substantial increase over the previous month, especially from railroad sources, and the prospects for a good summer's trade are much brighter than a month ago.

Manning, Maxwell, and Moore said they did a good trade during May, with small orders the feature, but yet making up satisfactory monthly totals. In cranes they booked some particularly good orders.

The Prentiss Tool and Supply Co. says the May business was all that could be expected. Underlying conditions in machine tools are getting better with the passing of each month.

James McCabe said business with him in May was better than in April, with the prospects for improvement in the near future looking much brighter.

The Van Dyck Churchill Co. reports that May was marked with a steady trade. Some fairly good orders were booked and inquiries showed a gain.

The Ingersoll-Sergeant Drill Co. was much pleased with the business booked in April and reports a substantial increase in inquiries also.

The Rand Drill Co. reports a very satisfactory business for May, with both domestic and foreign centers figuring in the orders. Its representatives speak very hopefully of the outlook, and are confident that they will swell their order lists considerably in the near future.

The Crocker-Wheeler Co. found May a very good month and closed several fine contracts that have been hanging fire for some time, and negotiations leading to some excellent orders are fast reaching the closing point.

The American Wood Working Machinery Co. finds trade in its line to be in much better shape than at any time this year. The demand extends to all of its machines, and cover a wide territory. Prices are being well maintained.

The A. & F. Brown Co. and the George V. Cresson Co. declare that the power transmitting machinery trade has been very good recently, and the general conditions augur well for its continuance.

Thayer & Co. booked some substantial orders in steam boilers during the past month, all of them being for small units.

The Hoover, Owens, Rentschler Co. reports the engine trade to have picked up considerably during the past month, and with conditions as to the immediate outlook holding out much promise.

The Lidgerwood Manufacturing Co. received some good orders for hoisting engines during the past month. Some good contracts are in process of closing.

The Republic Iron and Steel Co., has placed an order with Allis-Chalmers Co., of Milwaukee, for one horizontal cross compound condensing Bessemer blowing engine for its Youngstown plant. The high pressure cylinder will be 46 inches in diameter, the low pressure cylinder 88 inches and the 2 air cylinders each of 76 inches effective diameter. The stroke is to be 60 inches. The engine will be capable of delivering 24 thousand cubic feet of free air per minute at a pressure of 28 pounds per square inch. The large size of this machine makes the order worthy of special note.

Dodge & Day, Engineers and Architects, Philadelphia, Pa., made a preliminary examination a short time since of the plant of the Link-Belt Machinery Co., Chicago, Ill. As a result, they have been further commissioned to make a thorough examination of the mechanical and electrical features with a view of making a layout that will accomplish in the most economical and effective manner the scheme of changes and improvements contemplated by the management. It is probable the power plant will be enlarged, and considerable additional electrical equipment installed, as well as some new machine tools. This, however, will not be determined until the engineers have made their report.

The Zug Island Furnace of the Detroit Iron and Steel Co.

The blast furnace of the Detroit Iron & Steel Co., on Zug Island 4 miles south of Detroit, Mich., is noteworthy in that it was especially designed for the production of foundry pig iron, using as fuel retort or by-product coke, and that its design embodies a number of departures that in practice have fully borne out the calculations of the engineers of construction. Though pig iron was produced in the vicinity of Detroit more than 50 years ago, and one of the charcoal furnaces still operated at Detroit was built in 1863, the Zug Island furnace is the first in the state to produce coke iron. The Detroit Iron & Steel Co. was incorporated in 1902. The project was first conceived by C. W. Baird and Andrew H. Green, of Detroit, as a Detroit enterprise, but not sufficient capital could be enlisted and at length the plan was laid before M. A. Hanna & Co., of Cleveland. F. B. Richards, acting for that firm, took up the matter in co-operation with Mr. Baird and the company was organized under Michigan laws with a capital of $750,000 preferred and $750,000 common stock. This was subscribed principally by Syracuse, N. Y., Detroit, Pittsburg and Cleveland interests. The officers of the company are the following: D. R. Hanna, president; R. L. Ireland, vice president; F. B. Richards, general manager; C. W. Baird, secretary and treasurer; Granger Whitney, superintendent. Max McMurray, furnace manager for M. A. Hanna & Co., has general supervision of the operating end.

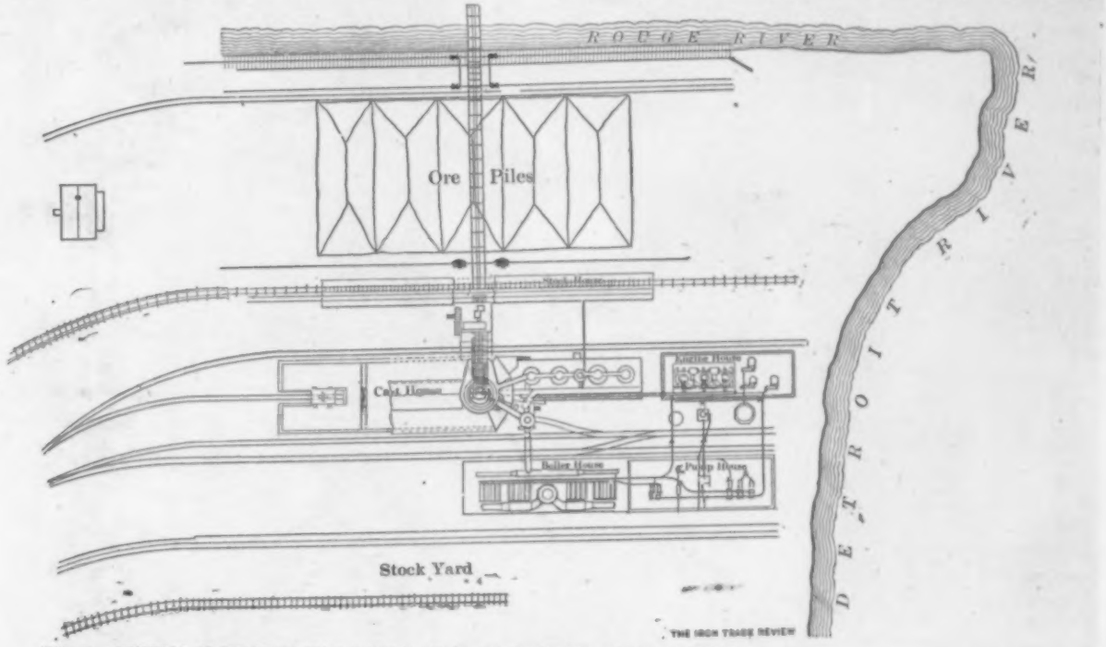


FIG. 1.—GENERAL PLAN OF DETROIT IRON & STEEL CO. FURNACE ON ZUG ISLAND.

The furnace site on Zug Island consists of 30 acres and the company has a five-year option on 20 acres additional. As the accompanying plan now shows, the Detroit river is on the East, the River Rouge on the North. A canal was cut across some years ago on the South and West of the tract so that it is entirely surrounded by water. The engineers had a marsh on which to begin construction work, with rock about 90 ft.

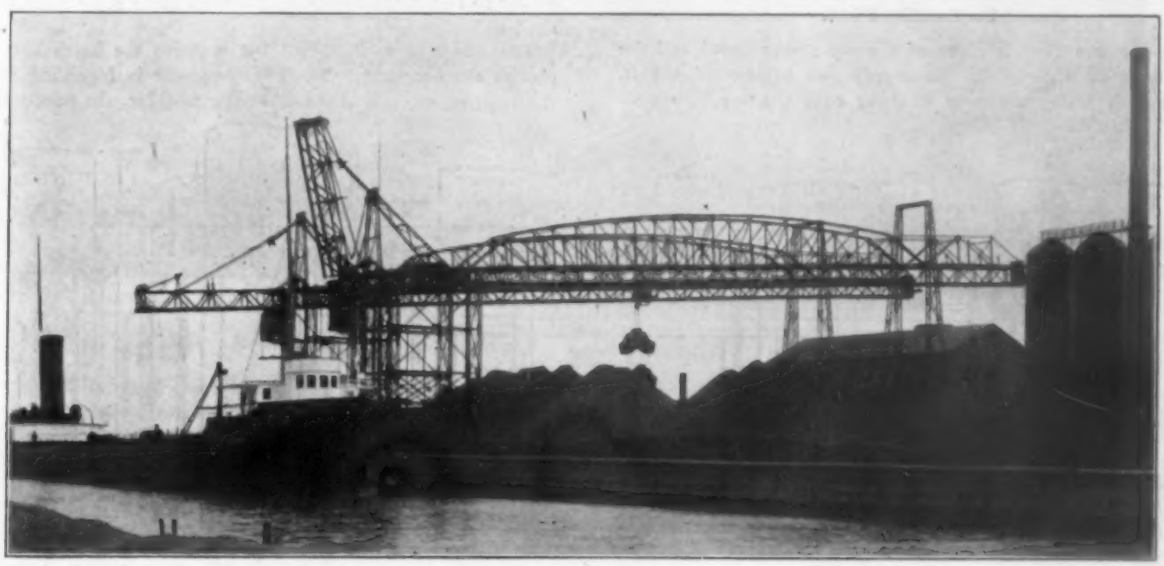


FIG. 2.—HULETT ORE UNLOADING PLANT BUILT BY WEBSTER, CAMP & LANE MACHINE CO.

below the surface. For the foundation of the furnaces, stoves, power house and dock piles were driven to a depth of 70 ft. (two 35-ft. piles) and the top of the upper pile was driven to the water level, concrete being used from that point up. The piling for docks and furnace and stove foundations was calculated to take a load of 30 to 35 tons to the square inch.

Ground was broken in the fall of 1902 and construction

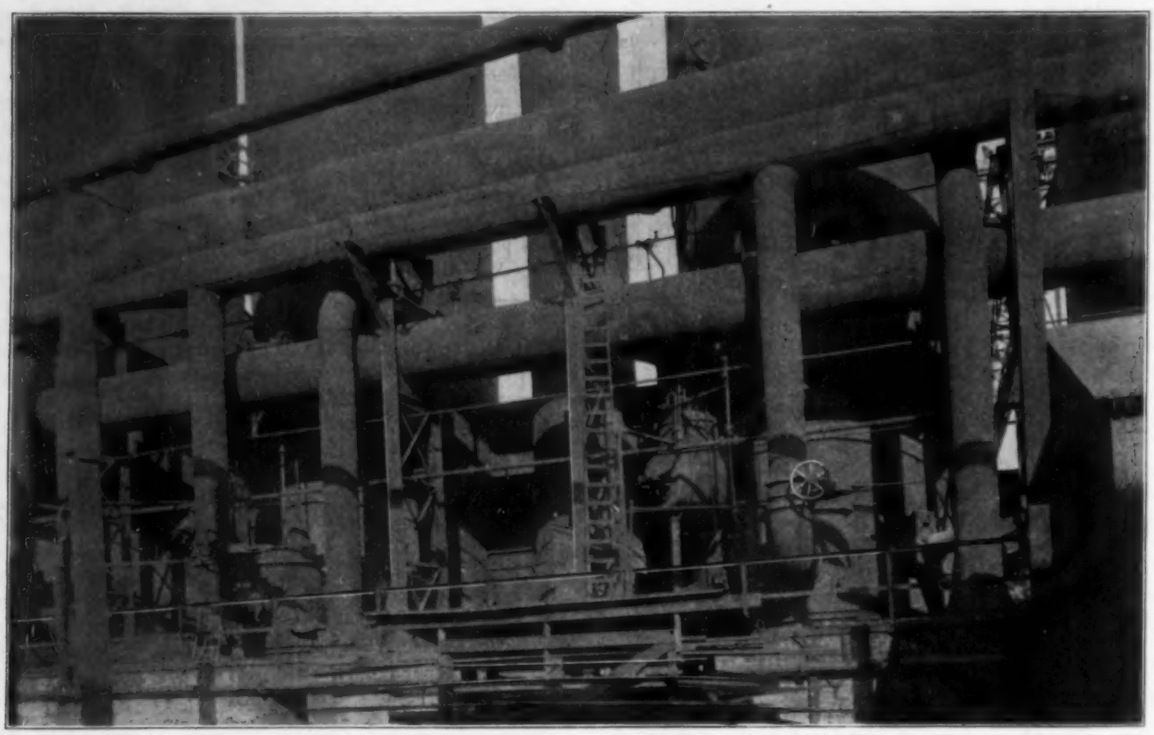


FIG. 3.—VIEW OF STOVES, SHOWING ARRANGEMENT OF PIPING AND VALVES.

work was under way throughout the year 1903, a boilermakers' strike in the spring and summer of that year setting back operations greatly.

Ore Handling Plant.

In Fig. 2 a view is given of the ore storage yard and the ore-handling equipment. There are two bridges of 173 ft. span with 50-ft. cantilever reaching over the ore bins near the furnace and with a boom extending over the vessel. The unloaders are electrically operated and provided with a Hulett two-part automatic bucket of 5 tons capacity suspended from a trolley. In operation, the boom is lowered over the boat in the usual way, and about 65 percent of the ore is removed from the boat by the automatic bucket, this being the amount of ore that can be profitably taken out in this way. This ore is taken back and dumped either into a railroad car near the front of the dock, or on to a stock pile, or it can be dumped into bin-filling cars on top of the bins under the cantilever, or it may be taken from stock piles to bin-filling cars by the same bucket.

To remove the balance of the ore from the boat the Andrews scraper, invented by M. Andrews of M. A. Hanna & Co., is employed. An electric winch with a 16-h. p. motor and controller operates two ordinary road scrapers in the hold of teh boat beneath each hatch, these latter scraping the ore together so that it can be readily gathered up by the Hulett clam shell unloaders.

The winch is so designed that it spans the hatch and no clamps are necessary. The electric power is furnished from the overhanging arm of the unloading machine. In comparison with unloading records at lower lake docks before the Andrews scraper was used, the latter has increased the capacity of all unloading plants upon which it is used about 50 percent, has reduced the number of men, and when delays formerly encountered are considered the cost of unloading has been materially reduced.

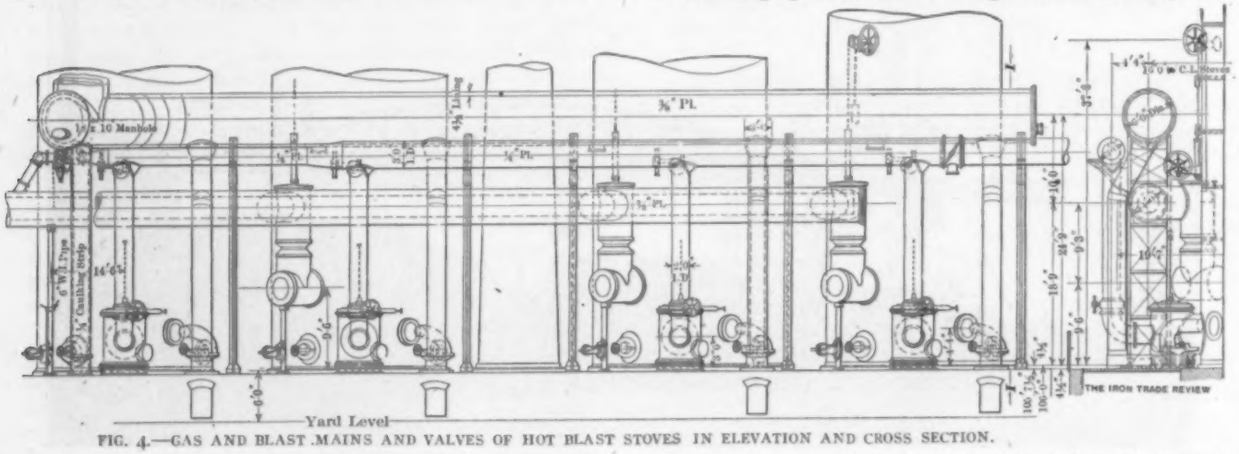


FIG. 4.—GAS AND BLAST MAINS AND VALVES OF HOT BLAST STOVES IN ELEVATION AND CROSS SECTION.

The furnace stack is 17½ ft. in diameter at the bosh and

78 ft. high and is designed to produce 250 to 300 tons of foundry iron in 24 hours. It has made as high as 339 tons in a day and the record for the best month is about 8,800 tons. The consumption of by-product coke, which at the beginning was as much as 2,400 pounds to the ton, has been more recently as low as 2,100 pounds to the ton.

The coke is made in ovens of the Solvay Process Co. located near the Detroit furnace. At first there mere 60 ovens; the number has now been increased to 120. Considerable experimenting with coals has been carried on, with the result that it has been satisfactorily demonstrated that a good furnace coke can be made in retort ovens, and with a maximum of by-products, where coals are carefully mixed and the coke carefully made. For the most part West Virginia and Virginia coals have been used in the manufacture of coke for the Zug Island furnace, with some lesser admixture of Pittsburg coals.

FIG. 5.—VIEW OF FURNACE TOP.

An unusual number of special features have been embodied in the design of this furnace and its equipment, and its engineers, the Garrett-Cromwell Engineering Co., have had the satisfaction of seeing all these innovations prove themselves distinctly successful in the 16 months the furnace has been in operation. Chief of the devices and arrangements referred to are a simple and effective distributing top, electric operation of both furnace bells, special features in the design and support of the furnace bridge, an arrangement of all stove valves making them especially accessible, the straight alignment of all blast mains and the general arrangement of the furnace top as shown in the elevation in Fig. 6.

The Distributing Device.

A detail section of the top-filling mechanism is shown in Fig. 5. Its essential departure from what has been heretofore in use is the introduction of a distributing cone between the upper and lower bells. This cone secures a thorough mixture of the coarse and fine material as it passes from the receiving hopper to the apex of the large bell. When the upper bell is lowered, the stock in sliding from it strikes upon the inwardly inclined sides of the deflecting cone. In sliding down the deflector the converging currents of material impinge upon each other, being outwardly directed to and upon the lower bell. A good central distribution of the stock is thus obtained within the lower hopper before charging it into the furnace. The excellent character of this distribution is shown by the inspection of the material as it is delivered upon the lower bell, and what is more convincing, the operation of the furnace has proved as satisfactory as has been obtained by hand filling. The height of the distributing device is from six to eight feet less than that of the majority of distributers in use. This reduces the fall and consequently the breakage of the coke.

Hoisting Bridge.

The special feature of the bridge on which the stock is carried to the top of the furnace is its method of support. The upper end of the bridge is carried by two pivoted links, the lower ends of which bring the load centrally upon the shell at diametrically opposed points on the furnace top. This avoids eccentric loading, which would tend to make the furnace lean from the vertical position. The bridge is also pivoted at its lower end, as shown in Fig. 8, so that the vertical movements of the furnace in expanding and contracting under heat will not injure the bridge supports. One of the pivoted links supporting the bridge at the top is used also for

suspending a chain for changing bells and hoppers. This can be very readily done, as the supporting links occupy a small space and permit ready access to the bell and hopper mechanism.

Method of Changing Bells.

In Fig. 10 is given the plan of the top, which illustrates the method of changing bells. The following directions are given: Remove the upper cone D in two halves. Raise the receiver C about 18 inches. Insert the two rails E between the receiver and the bottom ring. Attach the large bell to the rails, if it has not been dropped into the furnace. Remove the bell rods, the small bell and its seat. Raise the old large bell B and the hopper A to the top platform. Place the old hopper over the new bell on the top platform. Lower the old hopper A and

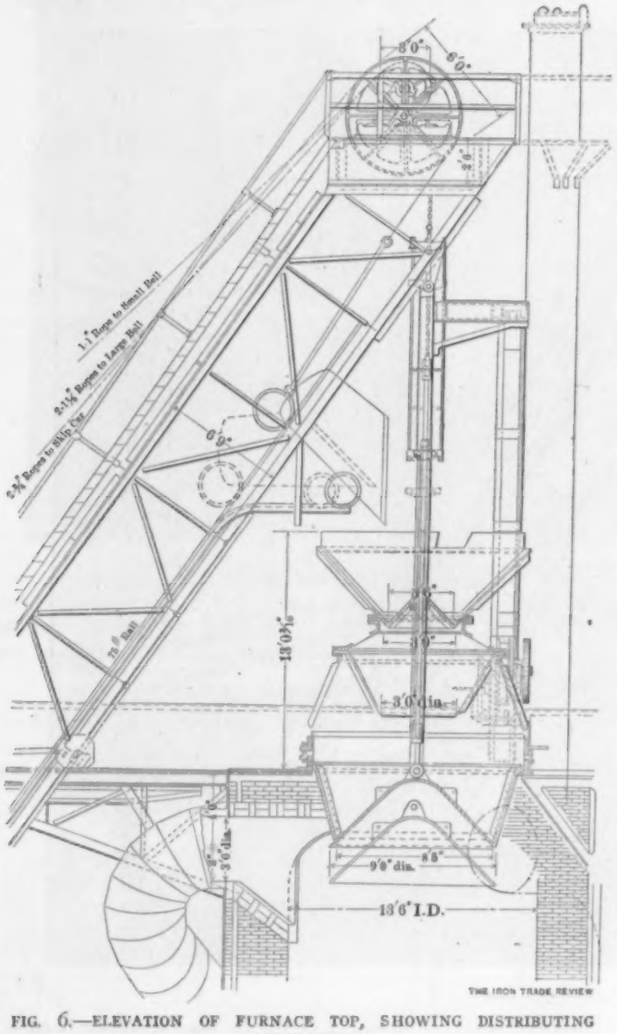


FIG. 6.—ELEVATION OF FURNACE TOP, SHOWING DISTRIBUTING APPARATUS.

the new bell B into proper position. The concluding operations consist of placing the rails in position and attaching the new bell; putting the receiver C on the rails; placing the rods, small bell, etc., in proper place; attaching the rod to the large bell and removing the rails, and finally lifting the cone D again into position. This changing is also facilitated by the method of securing the hopper, which is clearly indicated in Fig. 7. The shell of the receiver sits directly upon the hopper, and consequently the hopper is secured in place by the same bolts that fasten the receiver to the platform. These bolts are fastened with keys and are readily accessible.

Electric Gear for Operating Bells.

Both bells of the furnace are handled by electric motors. This does away with all pipes and eliminates the chances of freezing where water or steam is used, and of fire where oil is used. One or two fires under the latter circumstances have proved quite disastrous. The electric bell apparatus is located in an enclosed house near to the ground, and thus easily looked after, as indicated in Fig. 8. Nothing in the way of machinery is carried on the top of the furnace except the sheaves which carry the ropes and chain for working the bells and the two skips. In the hoist house is a standard Otis Elevator Co. electric hoist in which the ordinary winding drum has been replaced with a crank. Revolutions of the crank open and close the bell and give it a dwell motion at both the open and closed positions, giving ample time for discharging the stock and allowing the bell to come to a set slowly. The weight of the bells and their charges are over-counterbalanced. Thus the work performed by the electric motors consists in raising and lowering the counterweight. When the upper bell is seated the crank is in a vertical position, projecting downwardly, as in Fig. 8. To dump the charge the operator starts the motor, turning the crank from its vertical position into successive angular positions, thus lifting the counterweight and allowing the load of the charge to force the bell down. The movement of the crank is comparatively slow, and is so timed that in one revolution the stock will be discharged before the bell is again lifted to its seat by the counterweight.

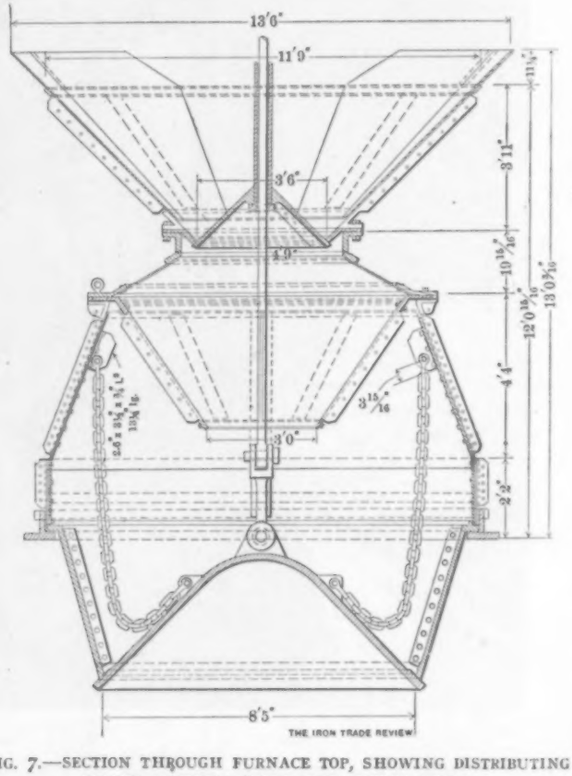


FIG. 7.—SECTION THROUGH FURNACE TOP, SHOWING DISTRIBUTING DEVICE, BETWEEN LARGE AND SMALL BELLS.

The first portion of the movement of the crank is an idle movement, taking up the slack in the connecting chain, and owing to its changing angularly as the chain in the last quarter of its stroke moves from a horizontal down to a vertical position, the movement of the bell will be slowed by allowing it to seat without sudden jar under the action of the counterweight. In order to reduce the amount of power required in lifting the weight which closes the main bell another weight, occupying the middle position of the three counterweights shown in the illustration, hangs upon a chain extending over an upper pulley and down to a connecting rod on the crank. When the bell is closed the movement of the crank is stopped by an electric cut-out and brake, and the crank is then in a down position. The second weight, therefore, ex-

erts no influence tending to turn the crank, and the bell consequently remains seated. When the crank begins to turn, however, the assisting weight at once exerts a lift upon it which thus aids in raising the main counterweight and lowering the bell, while on the latter half of the stroke the crank lifts the assisting weight and allows the main weight to close the bell.

Stoves, Engines and Power Plant.

There are four hot blast stoves, 20 ft. in diameter and 83 ft. high. They are of the two-pass, central combustion type, with lining built entirely of standard shape brick securely bound together by special arrangement. All the valves of the construction are located on one side, thereby doing away with the annoyance to the operator of running entirely around the stoves to change the valves. The valve and piping arrangement is shown well in Fig. 4. It permits of all the blast mains running in straight lines and thus saves in friction.

The blast is supplied by three blowing engines of the long crosshead type, built by Wm. Tod & Co., of Youngstown, O. Two of the engines are high pressure, having steam cylinders of 42 in. diameter by 60 in. stroke. The low pressure steam cylinders are 80 in. diameter by 60 in. stroke. The blowing tubs are 84 in. diameter.

There are eight 250-h. p. boilers of the B. & W. type, manufactured by the Aultman-Taylor Co., of Mansfield, O. Electric power is obtained from three 200-k.w. Ellwell-Parker direct connected generators, driven by Ball engines. The water supply pumps, which are 12 and 22 in. by 18 and 24 in., and the boiler feed pumps, which are 8 and 12 in. by 7 and 16 in., were built by the Epping-Carpenter Co., of Pittsburg. The hydraulic pressure pump, which is 16½ in. and 28 in. by 4½ and 24 in., was built by the Wilson-Snyder Mfg. Co., of Pittsburg. The condenser was furnished by the Southwark Foundry & Machine Co., of Philadelphia, and the heater by the Stillwell-Bierce & Smith-Vaile Co., of Dayton, O.

The product of the furnace is sand cast iron which is delivered from the floor of the cast house to a pig-breaking machine, built by the Brown Hoisting Machinery Co. This machine was described in *The Iron Trade Review* of Nov. 28, 1901. The pigs are graded as they come from the pig breaker and loaded into cars for shipment or conveyed in special pig iron cars to the furnace storage yard. There is direct railroad connection with the Michigan Central and Detroit Southern railroads. By using the Solvay Process Co.'s bridge across the River Rouge and its tracks the furnace company also connects with the Pere Marquette, the Wabash and the Grand Trunk railroads.

The furnace company has built a trestle for the receipt of its coke and limestone, but this arrangement is temporary. A bin system is planned, but owing to the low winter temperatures encountered at Detroit this problem will be worked out when fuller data are gathered. Meantime hand bottom filling is employed. It is the expectation that 200,000 tons of Lake Superior ore will be unloaded at the furnace company's docks this season.

Location of New Mills.

The locations for the new mills and steel plant to be built by the Youngstown Sheet & Tube Co., Youngstown, O., have been decided upon. The steel plant, cupolas, converters, blooming mill, billet and sheet bar mills will be located south of the present plant. The plate mill will be located to the north of and at the side of the present skelp mill. The Morgan continuous skelp mill will be built south of and at the side of the present skelp mill. The blooming mill will have a rolling capacity of 2,000 tons daily, and the billet and sheet bar mills will be capable of handling the capacity of the blooming mill and both mills will be operated at the same time if desired.

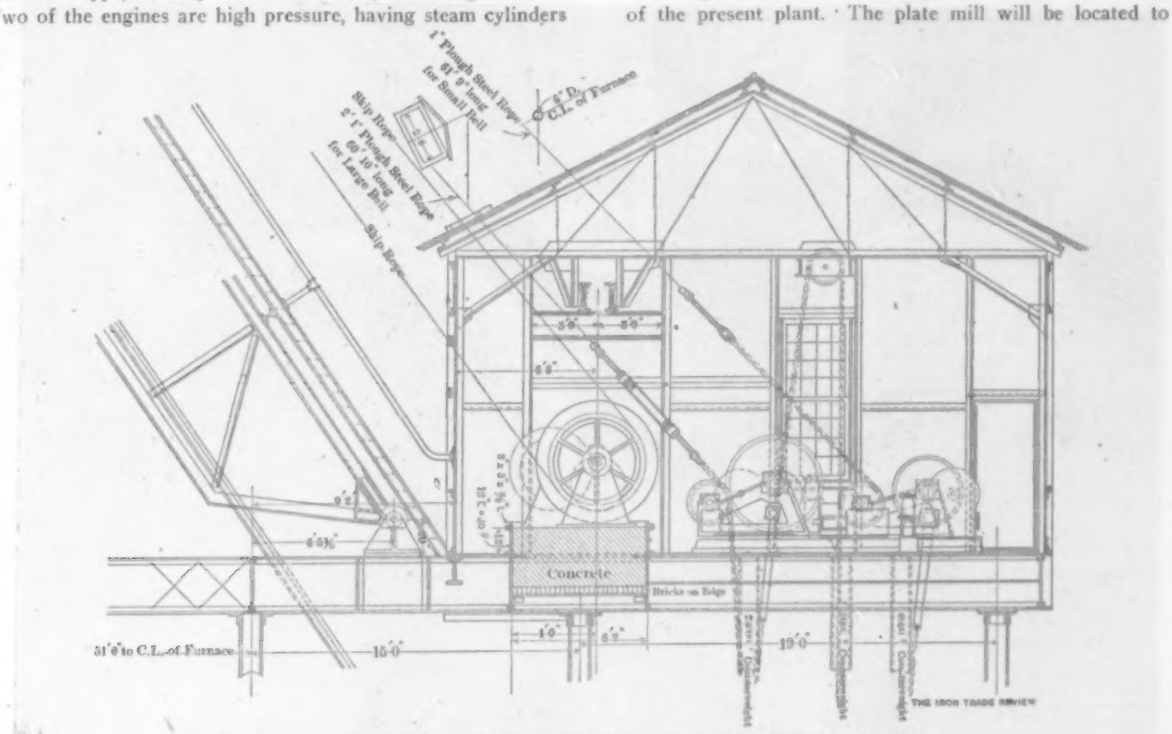


FIG. 8.—SECTION THROUGH HOIST HOUSE, SHOWING BELL OPERATING MECHANISM.

The recent fire at the plant of the Schau-Batcher Pipe Works, Sacramento, Cal., was not of a very serious character, the principal trouble being the interruption of business and delay in filling contracts. The plant is now being rebuilt and, benefiting by past experiences, the company is providing for a still better plant, although, before the fire, officers of the company thought they had the most complete plant on the coast for manufacturing riveted pipe.

Work of repairing the plant of the James Ohlen & Sons Saw Mfg. Co., Columbus, O., after the recent fire, is now progressing rapidly and the building will be complete within a week. All the machinery was saved from the fire, but a great many belts and pulleys must be replaced. Most of the damage was to the building.

STEEL IN STAPLE FORMS FOR HOUSE BUILDING.

BY JOHN DRUMMOND.

The natural course of events in machinery manufacturing circles leads the jobing shop into specialization. The cross roads repair works begins the manufacture of ice picks or something similar and then has an outlet for the productive capacity that otherwise makes a surplus when the farmer runs to recreation or rusts as he may elect. This tendency to take the peak of the load and even up the hills and hollows is the common course and when farming implements are needing fewest repairs then the cross roads utility plant fills in the slack place with stock work, whatever that may happen to be.

The iron business is not on all fours with the machine shop proposition, or at least it does not seem to work out the same way. Just why there is this difference between things which have much in common is not nearly so evident to me as it may be to others. Take the widely fluctuating figures on pig iron: Northern No. 2 foundry in Chicago being recently at $17.50; in December last, $16.60, and in July, 1904, $13.30. Tank plates showed even a greater spread—$35.30 last August and $29.30 the month following. There may be a good chance for speculation in the accumulation of stock on a falling market and unloading on the rebound. I suppose the objection to any enterprise in this direction is barred by the bulky nature of the material and the attendant heavy charges for storage and handling facilities.

There is, however, another avenue which from my standpoint holds out more hope of success for the steel manufacturer in particular. If the railroads would keep up a steady demand rails could be made and stocked ahead for the regular call of competing and progressive companies. But this is not the case; and the feast and famine periods must succeed one another as heretofore. Meantime there is the growing use of steel for sheet piling, for concrete reinforcement, for railroad ties and structural material of certain sizes, to work out standard forms and specifications of so uniform a type as to allow the stocking of staple sorts and styles of steel.

Patent rights covering many of these special shapes give considerable latitude in sundry cases to manufacturers gaining in the race and accumulating stock where the demand for the product is considerable and may therefore be profitably met in advance. The field in steel ties does not seem to be settled to the extent of encouraging the production in large quantities of any one of the several ties thus far under experiment. The railroads do not seem agreed upon the wisdom of adopting one of these to the exclusion of the others. More time is required doubtless before a final selection by representative railroads will be made. The case is somewhat the same with the numerous forms of concrete reinforcement, as well as patent piling.

Stll another chance is in the framing of houses. Houses up to the $5,000 limit bear a strong family resemblance. Beyond that price they are curiously similar and in many details the likeness is very close. It would seem to be eminently worth the consideration of steel works engineers just how this material can be profitably prepared for further architectural uses. That it can be applied with neatness and strength to building construction is certain from the properties of the metal, and the question as to the practicability of making steel frame houses in quantities in as simple elements as local constructors can handle and suitably erect, or in the more elaborate form of complete sets of parts in "knocked down" condition ready for assembling, is really nothing more than a discussion of just this problem: Is the market prepared to receive the goods? If the steel maker can do this work at a profit it will enable him to fill in the inequalities of business with about as staple a product as he can well desire. Can he make it pay?

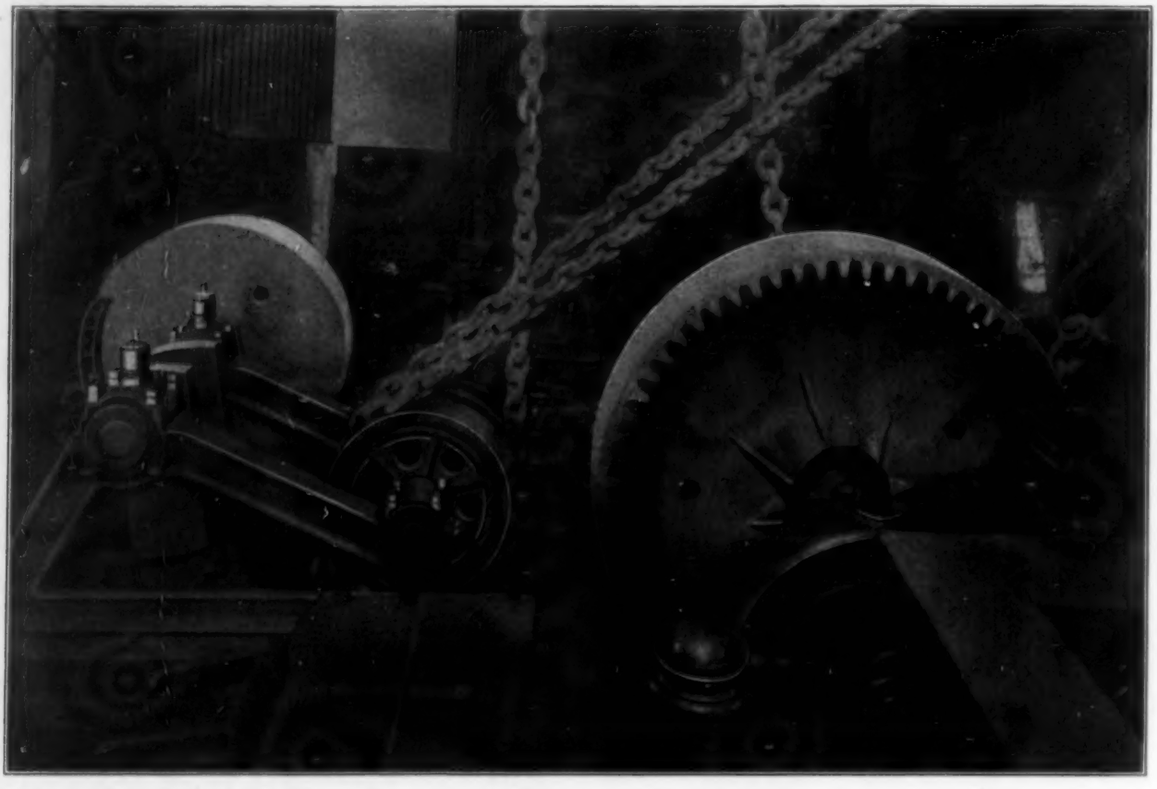


FIG. 9.—VIEW OF HOISTING MECHANISM.

The Capital Iron Works, Topeka, Kan., have decided to make extensive additions to their plant, and improvements will be completed by Oct. 15.

CANADIAN INDUSTRIES.

Rapid Progress at Rail Mill of Dominion Iron & Steel Co.—Smelting Iron by Electricity.

TORONTO, CANADA, May 30.—Rapid progress is being made with the steel rail mill of the Dominion Iron & Steel Co., at Sydney, N. S., and it is expected that it will be in operation in the course of a week or two. The full capacity will be 500 tons per shift or 1,000 tons per day, but this will not be reached for some time. Frank P. Jones, selling agent of the company, has been booking exclusive orders from railroads in Eastern Canada for the delivery of steel rails at early dates. The demand for other products of the company is also active.

Preparations are going forward for the erection of the plant of the Canadian Tin Plate & Sheet Steel Co. at Norris-

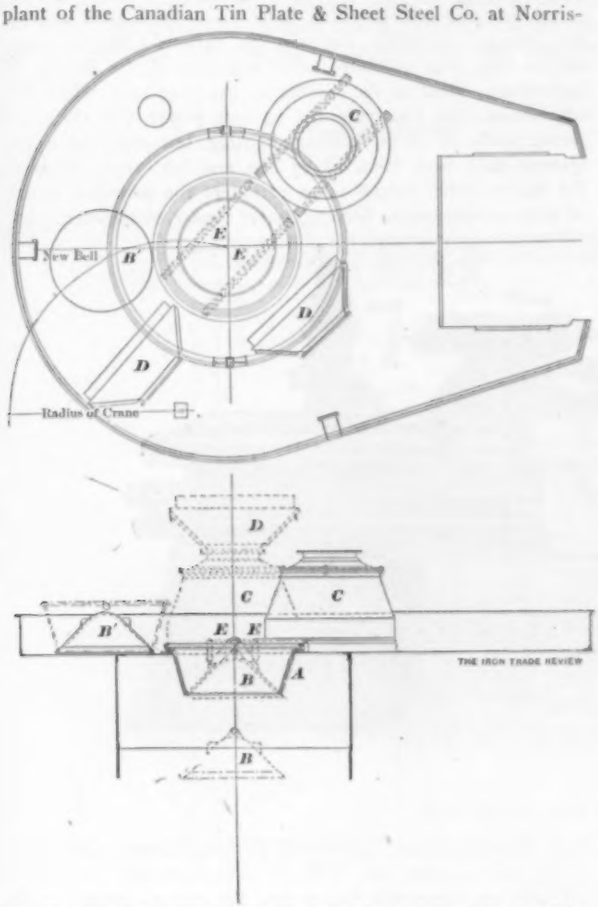


FIG. 10.—DIAGRAM INDICATING METHOD OF REMOVING ORE RECEIVER AND THE LARGE BELL.

burg, Ont. The company is arranging to bring out two hundred skilled plate and sheet iron workers from South Wales to be engaged in the industry and teach the other hands to be employed there. An effort is being made to interest a number of Toronto and Montreal capitalists in the industry so as to put it on a more extensive basis than at first contemplated and should this prove successful it is proposed to re-organize the company with a capital of $1,500,000. In the meantime some of the statements which have obtained currency as to the scope and prospects of the company are premature. No arrangement has so far been made, as was reported, for securing a supply of raw material from the Dominion Iron & Steel Works at Sydney.

The steel rail plant at Sault Ste. Marie has filled an extensive order for 80-pound rails for the Canadian Pacific Railway, and is now turning out 100-pound rails for the Michigan Central for use on their Canadian lines. These are the first rails of this weight made by the company.

The Dominion Government has appropriated $15,000 for the purpose of making a practical test in Ontario of the process of smelting iron by electricity. F. H. Clergue, of Sault Ste. Marie, has offered the department a building and free power for electricity for four months, and it has been decided to make the experiment there. Dr. Harault, of France, who has a European reputation as an expert in electric welding will be in charge and make the test. Experiments will also be made in treating the nickel ores of Sudbury.

The following companies have been incorporated under the laws of Canada:

Duncan Electrical Co., Montreal, capital $90,000; incorporators, Charles Duncan, Wm. P. Baird, William King, Frederick Loomis, and Miles L. Williams.

Canadian White Co., Montreal, electrical contractors and

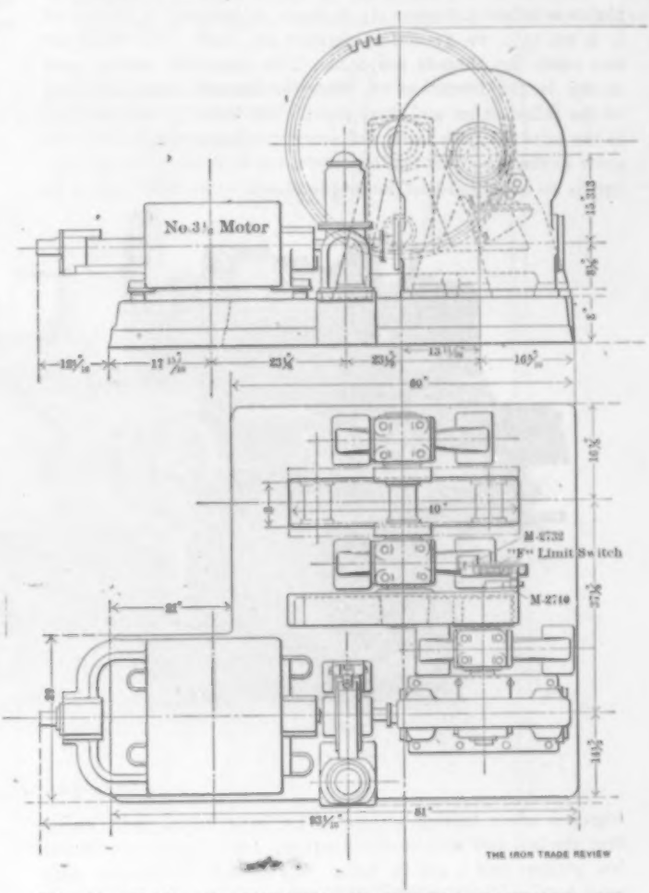


FIG. 11.—PLAN AND ELEVATION OF ELECTRIC MACHINERY FOR OPERATING BELLS.

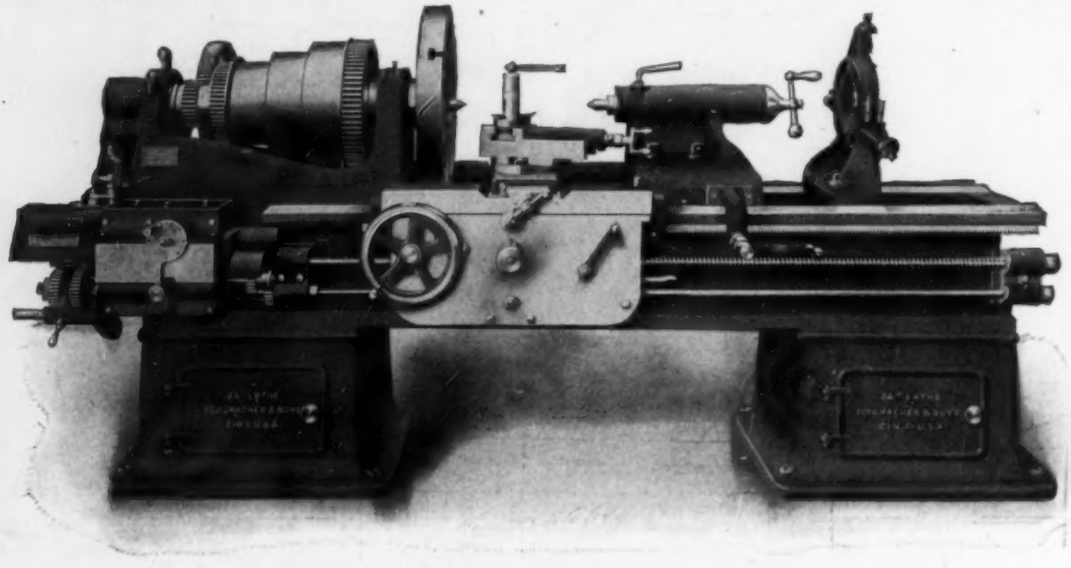
manufacturers, $1,000,000; incorporators, William G. Ross, Robt. C. Smith, Ronald C. Grant, Waldo W. Skinner and W. F. Chipman.

Fire destroyed part of what was at one time the plant of the Speedwell Iron Works, near Morristown, N. J. The building had been unoccupied since 1870, and it is presumed the fire was started by tramps. In 1800 it formed part of the iron works in which Stephen Vail and Samuel F. B. Morse invented the first telegraphic instruments. It was also at this factory that the boiler of the Savannah was made in 1819, the first steamship to cross the Atlantic. Until 1870 the factory was operated by Confield & Lidgerwood in the manufacture of shovels and hoisting engines.

The Zahner Mfg. Co., Kansas City, has purchased a site and will erect a plant for the manufacture of galvanized cornices.

SCHUMACHER & BOYE LATHE.

The illustration depicts the 24-in. instantaneous change gear engine lathe built by Schumacher & Boye, of Cincinnati. This machine has a three step cone and double back gear. Cone steps are of suitable width for a 4½-in. belt, which gives three speeds on open belt, three speeds first back gear, three speeds second back gear total speeds nine, which can be doubled by two speeded countershaft, belts running in the same direction. The gear box has forty changes for feeds and screw cutting, ranging from 1 to 28 threads per inch. With the top index handle in hole No. 5, the following threads per inch can be cut when the front index handle connects with holes 1 to 8 respectively: 16, 18, 20, 22, 23, 24, 26, and 28. When the top index handle is in hole No. 4 and the front index handle is in any of the places numbered from 1 to 8 there is obtained a choice of 8, 9, 10, 11½, 12, 13 and 14 threads per inch. The feeds are five times the threads per inch. This ingenious change gear device is the invention of Wm. T. Emmes, superintendent of the Schumacher and Boye plant. The lathe has reverse feed in the head for both feeds and screw cuttinw and has also a reverse in the apron for feeds, power cross feed, etc. The mechanism is so arranged that longitudinal and cross feed cannot be engaged when cutting screws. The lathe has a 25-in. swing over the bed and 16½ in. over carriage. The spindle has a Morse No. 4 taper and a 2⅛ in. hole. The spindle revolutions with open belt are respectively: 312, 208, 139 and the approximate horse power developed, 7, 6 and 5. With the first back gear in, the revolutions are 88, 59 and 39, and the horse power 7, 6 and 5. With the second back gear in, the spindle revolutions are 32, 21 and 14, the approximate horse power developed is 7, 6 and 5. The 18, 20, 24, 26 and 28-in. instantaneous change gear lathe of this make are furnished with three step cone and double back gear; the 30 and 32-in. lathes with four step cone and double back gear, and the larger sizes, that is the 36 and 42-in., are made with either back or triple geared with five step cone. The 48-in. lathe is made triple geared only.



A 24-IN. LATHE WITH NEW CHANGE GEAR.

The Steuterman National Invention & Manufacturing Co., of St. Louis, Mo., will utilize its new plant in Belleville, Ill., for the manufacture of gasoline engines for the propelling of locomotives, street cars and other vehicles, and will also make other machinery and tools in this plant. Employment will be given to a large force of men. The company owns a 10-acre property within the limits of the city, on which it is now erecting its buildings.

AN ENGINEER'S RECORD.

The portrait of Robert Calladine appears in the thirty-third annual report of the House of Correction of the city of Chicago. He has been engineer of that institution for thirty years and his public service is of a type well worth acknowledgement. The *American Machinist* has an appreciative account of his career from which we make the following abstract:

Born in Niagara Falls in 1846, and subsequently graduating from the public schools, he entered the employ of the New York Central Railroad, working up to be engineer on the Buffalo division, and in 1865 came to Chicago, entering the employ of the Northwestern road. After seven years' service in various positions with that corporation, he left its employ and became consulting engineer for various Chicago firms, and in 1875 was appointed chief engineer of the House of Correction. Most of the institution has been built under his supervision, and especially the various power and electrical plants, while all of the heating, lighting, sewering and water systems have been installed by him and his "trade classes." He has probably taught more prisoners the principal points of such occupations as fireman, water tender, steamfitter, engineer, dynamo tender, sheet-metal worker, lineman, electrician, millwright, plumber, etc., than any prison official in the country, and one noticeable fact is that the average prisoner who had no mechanical training when received and was taught it there, has seldom returned. It is especially gratifying to record that in the thousands of prisoners assigned to his department, unskilled, many of them ignorant, that not a serious accident has befallen any during these thirty years, and it emphasizes the care and the judgment shown in the treatment of his men. If "he who makes two blades of grass grow where one grew before" is a public benefactor, surely "Uncle Bob" with the care, attention and training given thousands of unfortunates in order to fit them for a better place in the industrial world and teach them better habits of living, is a benefactor whose work should be even more appreciated, for without question it has been the turning point in the career of many prisoners.

The Wm. J. Oliver Mfg. Co., Knoxville, Tenn., has decided to double the capacity of its plant, and operation will be started as soon as possible. A new foundry will be added and the present foundry building will be used for additional machine work.

Joseph T. Ryerson & Son's New Plant at Chicago.

The spirit and energy of the Western merchant to do what others have not done and to carry stock which others could not, long ago put Chicago to the front as a great distributing point for iron and steel. A pioneer firm in this branch of industry has been that of Joseph T. Ryerson & Son, which was founded in Chicago by J. T. Ryerson in 1842. Its growth from a small supply house, occupying space for which a yearly rental of $200 was paid, to its present enormous proportions embracing nearly three city blocks of steel warehouses and office buildings, reflects the growth of the city in which it is located and represents progress based on increased usefulness to the manufacturer and contractor. The continued growth of the business led to the purchase of a large tract of land situated in the west part of the city and occupying nearly two city blocks upon which have been erected warehouses and shops believed to be the finest and best equipped of their kind in the world. When the prompt delivery of material stands for dollars and cents to the customer, merchants are obliged to give more than passing thought to warehouses, the details of their construction and the selection of mechanical equipment. The days when a man sent in his order for iron and steel and then awaited the pleasure of the manufacturer for delivery have passed, and so to properly meet the present demand for quick delivery, Joseph T. Ryerson & Son have spared neither time nor cost to make the new warehouses the finest and to carry in them the largest stocks of finished iron and steel in the world; the one purpose being to give a manufacturer or contractor anything in the line of iron and steel immediately upon receipt of his order.

The Sixteenth street plant covers a space bounded on the East by the tracks of the Pennsylvania and C. B. & Q. railroads, on the West by Rockwell street, on the North by Fifteenth street and extending South nearly to Seventeenth street. The warehouses are entirely of steel construction and are devoted to the storage of structural shapes, plate, bars, bands, hoops and machinery. Black and galvanized sheets, boiler tubes, rivets, boiler braces and the long list of specialties are kept in stock at the Milwaukee avenue warehouses. Bars and plates occupy the north warehouses—all sizes and all shapes from the lightest to the heaviest rolled are carried in stock and arranged in accordance to sizes. Trolley cranes have access to every portion of the floors so that any material can be quickly carried to the cars, wagons, or to the various machinery for cutting to length, punching, etc., without a second handling. The stock of plates embraces over 572 sizes and represents the largest stock in the world. The east end of this warehouse abuts on the Pennsylvania railroad and is bounded by a switch enclosed within the walls which runs

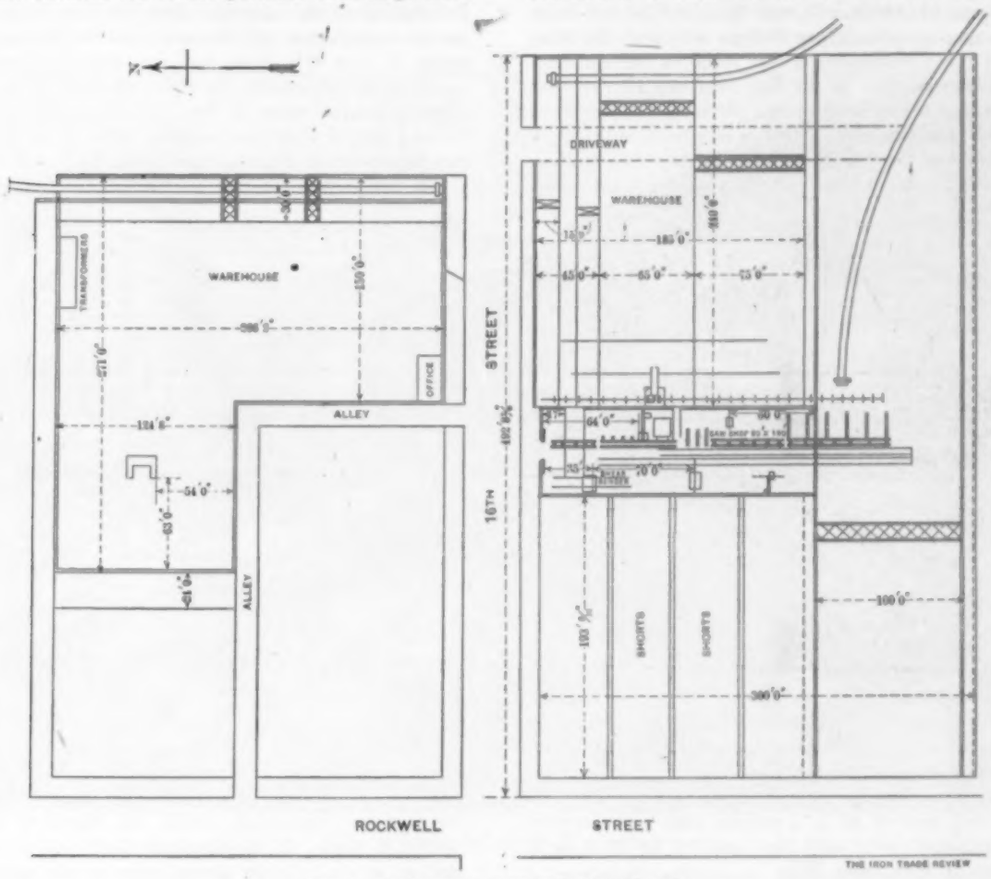


FIG. 1.—LAYOUT OF THE RYERSON PLANT.

the entire length of the building. Above the switch track there are two 30-ft. Whiting cranes of ten tons capacity each. There are also facilities for loading seven cars on a sidetrack just east of this warehouse. Occupying a central position on the lower floor of this building is installed the largest guillotine shear yet built. It is of Hilles & Jones manufacture, and stands 22 ft. high, weighs 222,000 lb. and is operated by a 50 h. p. three-phase Westinghouse motor, direct connected. The fly wheel weighs 7,000 lb. and revolves at 270 r. p. m. The stroke is at the rate of 18 per minute and the tool has a capacity of shearing 12 ft. of 1½ in. material at one stroke or punching 150 holes ½ in. diameter through the same stock.

The south warehouse proper is 240 ft. deep and 190 ft. wide and is used for the storage of structural shapes. As in the other buildings the various material is arranged and classified according to size. Four cranes cover every part of the floor and there is a spur from the Pennsylvania railroad tracks extending inside and the whole width of the building at right

angles to the crane travel. Loading platforms extend along the north side of this building so that wagons may be loaded directly by the cranes or by the supplementary equipment of hoists, etc. The stock of structural material carried includes not only the commonly used sizes but all those for which there is seldom call, the one idea being to have every section for which there is a demand in modern construction work. The housing of all the lighter weights of structural shapes insures the purchaser material free from scale and rust.

The transfer trolley crane system in this building comprises the most extensive system yet built. The area to be served exclusive of the yard is 25,600 sq. ft. The cranes consist of two bridges 72 and 62 ft. long, running parallel and connected by short stationary I-beams to a pair of 15-ft. bridges used for shipping purposes, between which there are a series of longer stationary beams. The runways for all the bridges are 240 ft. in length. Each bridge has suspended a 15-in. I-beam on the lower flange of which will run three trolleys of three tons normal capacity each. These trolleys will carry the hoist and a nest of three controllers within reach of the operator. A decided innovation lies in the fact that any of the four bridge motors may be operated by one of the three controllers in a trolley, so that whenever a trolley is run on a bridge it becomes a complete three motor crane; further, two trolleys may be operated on one bridge making a double hoist crane.

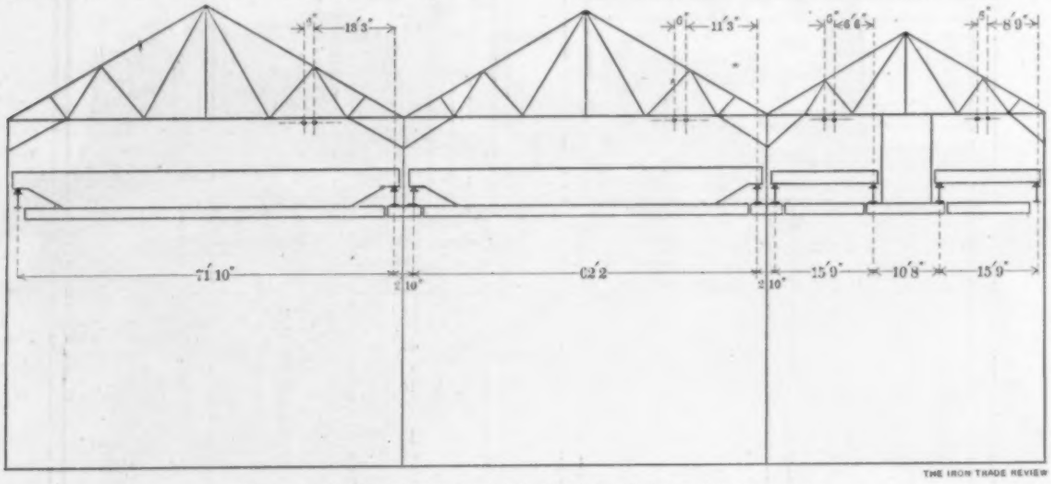


FIG. 2.—SECTION THROUGH WAREHOUSE, SHOWING CRANE SYSTEM.

Any number of trolleys may be added as demands increase or per contra the whole system may be operated by one man and one trolley. The speed of the bridge travel for all cranes and trolleys is 400 ft. a minute. The hoisting speed is 35 ft. a minute with full load or 70 ft. a minute light. The motors and crane equipment were built and installed by Pawling & Harnischfeger, of Milwaukee, Wis.

Immediately south of the structural warehouse and extending five hundred feet. from the Pennsylvania tracks to Rockwell street, there is a yard in which are piled and classified the heavy sections of beams, angles and channels. This yard is served by a crane 100 ft. wide and with runways extending its whole length. Cars may run into the yard reducing handling to a minimum.

Extending south from Sixteenth street to the beam yard and occupying the half block west of the structural warehouse is the shop building and yard in which short lengths of material are kept. This shop is well equipped with angle shears, friction saws, etc., and the arrangement of cranes and roller tables allows material to be easily transferred from one part of the shop to another or carried to and from the other buildings.

One of the most interesting pieces of machinery included in the shop equipment is the new 52-in. friction saw. This machine was specially designed for Joseph T. Ryerson & Son for the rapid and economic cutting of structural steel. The saw disc is 52 in. diameter; it is made of flange steel ⅜ in. thick and has a peripheral or cutting speed of 27,037 ft. per minute. It is connected by a 16-in. 3-ply belt to a 100 h. p. 220 volt, 580 r. p. m., alternating current motor. The drive pulley is 48 in diameter and the shaft pulley is 14 in., giving it a speed of 1,988 r. p. m. Material is carried to the machine from the yard and structural warehouse on power driven rollers and the same arrangement is used to carry the material away. Some idea of the rapidity with which this machine cuts steel can be gleaned from the fact that it passes through a 15-in. x 42 lb. I-beam in 9 seconds and through a 24-in. x 100 lb. beam—the largest size rolled— in 16 seconds.

The whole shop arrangement is most modern and designed and equipped with the purpose of enabling a contractor or manufacturer to secure material in exact accordance with his requirements and immediately upon receipt of his order. The plant carries a stock intended to be equal to any emergency. In addition to the common sizes, extreme sizes are carried for the convenience of customers and the equipment is competent to turn this stock into any shape desired, while the system employed enables the transformation to be made in the shortest possible space of time. To have what an order calls for and deliver it to the customer when he wants it and before he expects it, describes this enterprise in few words.

The Milwaukee avenue warehouses, occupying the block bounded by Lake street on the South, Milwaukee avenue on the North and East and Clinton street on the West have stocks of black and galvanized sheet steel, boiler tubes, rivets, heads, boiler braces, flanges, ferrules, machinery and nearly two hundred specialties which are regularly handled and carried in stock. In the basement black and galvanized sheet steel is stored. On the ground floor is the machinery stock room and the shipping department. This floor is equipped with air and electric hoists and such other mechanism as facilitate the handling and loading of material. The second floor is given mainly to a stock of rivets of which there are over 700 sizes and kinds varying in diameter from ¼ to 1⅜ in. The third floor is devoted to boiler tubes, Shelby cold drawn seamless, charcoal iron and lap weld steel tubes, all piled in separate sections and arranged in accordance with sizes. Machinery for cutting tubes to length is installed on this floor. On the fourth floor are the special grades of sheets such as electrical, Wellsville polished, Wood's planished, Ryerson's stamping and spinning steel, etc. The fifth floor is used for flanged and unflanged heads and for extreme sizes of sheets such as those for which there is infrequent requisition.

Joseph T. Ryerson & Son was incorporated in 1888. The officers of the company are Edward L. Ryerson, president; Clyde M. Carr, vice president and general manager; Joseph T. Ryerson, treasurer; Louis M. Henoch, secretary and Gilbert H. Pearsall, general sales agent.

DEMAND FOR MINING MACHINERY IN SOUTH AFRICA.

The following article in the engineering supplement of the London *Times* from its South African engineering correspondent is of interest to machinery manufacturers in the United States:

Now that the "long lane" of depression extending throughout South Africa has been successfully negotiated and an era of prosperity, probably greater than any previously experienced, is practically assured, a survey of the actual conditions under which the British engineering industry is carried on and the outlook will prove of interest. The chief causes for the satisfactory improvement in gold mining, which has at once been reflected in the commercial section of the community, are, first, the restarting of the mines and the development of others, and, second, the satisfactory results of the experiment of importing Chinese labor. Notwithstanding all the theoretical criticism, mainly adverse, the practical proofs have fully justified the step, for the increase of white labor, due entirely to the addition of nearly 92,000 coolies, has represented 8.3 percent in about four months. It is further estimated that the increase will amount to 10 percent of the newly imported unskilled labor.

Nearly every mineral is found and worked in various districts, but the principal are gold, coal, copper and tin. Diamond mining has, of course, always been a very valuable industry, and particularly during the past year, when some extraordinarily rich "finds" have been reported. The gold output for 1904 amounted to £17,025,355 ($82,843,890), that of coal £883,801 ($4,301,456), diamonds £1,185,083 ($5,767,206). The quantity of explosives manufactured in South Africa represented 5,208 tons; that imported 1,514 tons, making in all 6,722 tons. The amount spent by the mines on stores and machinery was £9,000,000 ($43,798,500). The output of one diamond mine, viz., the appropriately named Premier, was 749,653½ carats, which produced a net gain of £607,738 ($2,975,570), or, roughly speaking, £1 1s. 6d. ($5.23) every minute of the past year.

Among the recent valuable innovations in the Transvaal gold mining industry, perhaps the most important is the introduction of tube mills to permit of the ore being more finely crushed. So far as the working tests have gone, these mills have proved not only a great improvement, but also a distinct success. The great aim of these mills is to increase the extraction of gold by fully 5 percent, or, on the average, about 2s. (49 cents) per ton of ore. It has been shown that by their installation the crushing power can be augmented at less capital expenditure than would be necessary for the purchase and erection of extra stamps. Tube mills have, of course, been in use in Westralian mines for a number of years, so that their introduction places them on a sound footing from the practical point of view of South African engineers. Already the Modderfontein mine has secured three, while the several mines known as the "Eckstein Group" take thirty-two. Should these particular items of machinery prove to be as satisfactory as is confidently anticipated, there will undoubtedly spring up a very active demand, which provide great scope for inventive ingenuity and result in important and ever-increasing additions to the total of our machinery output.

FIG. 3.—PART OF THE YARD SYSTEM.

Electrical Machinery.

A prominent feature in mining gold, coal, tin, etc., in South Africa has been the remarkable increase in the demand for electrically-driven machinery. Hauling, lifting, pumping and lighting are fast being accomplished by its use. For lifting purposes a motor of the 3-phase induction type, working at a pressure of 500 volts, is a representative one, and is capable of driving 125 horse power. Where the depth is moderate 50-horse power motors are frequently employed. There is just now quite a craze amoung South African mining engineers for the newest and best electric plants for hauling and lifting purposes. Pumping is gradually being performed by means of electric power, the well known centrifugal pumps being largely used. These are also driven by steam, oil motors, and turbines, and are a vital necessity to many mines. For light-

ing purposes a vast and ever-increasing supply of plant and fittings are required.

As a rule, this work is done nowadays by electricity, on account of the handiness and convenience of the system, the motor being placed wherever desired, as against the inconvenience and loss of power occasioned by old-time methods. Boring drills are an absolute necessity in every class and description of mines, and afford a great and remunerative field for the engineering section chiefly devoted to their production. In addition to power-driven drills, a large quantity of small hand-power machines are in constant use, owing to the fact that it frequently is an impossibility to place in position one of the larger kind driven by other than hand power. There are a good many different types required, according to the geological formation and conditions of working, and manufacturers, in order to participate in this trade, should be practically conversant with the conditions governing each particular locality of the great mining area.

Gas-Driven Machinery.

Although electricity has the principal share of the burden to bear in connection with the working of the mines, it must not be assumed that the older and still very reliable and, on the whole, satisfactory gas engine is played out. On the contrary, quite a number of mine engineers and managers favor the use—partial, at any rate—of such, and only quite recently one of the leading mines on the Rand ordered a complete gas-producing plant for early shipment. The principal drawback is, of course, the necessary supply of raw material to produce the gas, which in certain districts is somewhat scarce.

A few years ago an inventor brought out a compact little plant designed for the production of cheap gas for mining and similar purposes, located far from municipal supplies. The invention consisted of a well-devised copper generator, wherein sulphuric acid and iron were combined, producing a gas far superior for power purposes to the ordinary "town" supply. By carburetting, the same was, of course, available for lighting also. The great drawback was that the residue had to be disposed of in order to reduce the cost, and this occasioned too much trouble to the user. The by-product (sulphate of iron) was a remarkably pure one, but the disadvantage referred to put it out of the realm of practical use.

FIG. 4.—INTERIOR OF A NEW WAREHOUSE.

LARGE APPROPRIATION.

Made by the Erie Railroad for Machine Tools—New Construction Planned.

The Erie railroad has made an appropriation of $1,500,000 which is to be expended in the purchase of machine tools for the re-equipment of the repair shops along its lines, and for building new round houses, turn-tables, etc. This is in addition to the very recent appropriations for new motive power. It has also placed an order with the American Locomotive Co. for 16 more engines of the Pacific type for exclusive use in hauling passenger trains over those sections of the road where heavy grades militate against fast time. These will be of the same type as the three recently delivered to the company and now in use on the New York division between Jersey City and Port Jervis, one of which attained a speed of 71 miles an hour on her trial trip, dragging a train of ten of the heaviest passenger cars owned by the Erie road. These locomotives with their three sets of driving wheels are the largest and fastest ever built for exclusive passenger service and weigh, with a tender carrying 16 tons of coal and 8,500 gallons of water, 389,750 pounds each. They are now being built at the Rogers works and all will be delivered by November next. Delivery of the 137 new freight locomotives is now about half completed, work on the last batch of 50 now being well under way with a promise of delivery of the entire lot by Sept. 1. This will put the Erie in first-class condition for the winter service, which is so trying on all railroads.

With so large an addition to the motive power comes the necessity for room to make repairs and the overhauling which every locomotive has to undergo annually. To provide for this work the Erie has appropriated the million and a half referred to for use in the erection and equipment of new machine shops, repair shops and round houses. At present the Erie has 1,461 locomotives to be cared for. The present capacity of the shops for repairs is 85 engines a month. New plants and additions to old shops will increase this capacity to 127 a month. The Hornellsville, N. Y., shop is to be enlarged so as to be able to care for 25 locomotives, instead of 10 as now. The capacity of the shops at Huntington, Ind., Galion, O., Cleveland, O.,

and Meadville, Pa., will each be increased by five engines, that at Buffalo by three, and those at Dunmore, Pa., and Stroudsburg, Pa., by 2 each.

Nearly $500,000 is being expended in providing new equipment of the latest design for the heavy work required, such as planers, lathes, steam hammers, cranes, etc. The principal expenditures in round figures will be $146,000 at Hornellsville, N. Y.; $80,000 at Meadvillle, Pa; $46,000 at Huntington, Ind.; $40,000 at Cleveland, O.; $34,000 at Galion, O.; $30,000 each at Dunmore, Pa., and Buffalo, N. Y.; $13,500 at Stroudsburg, Pa.; $11,670 at Port Jervis, N. Y.; $7,260 at Rochester, N. Y.; $6,500 at Bergen, N. J., and $5,500 each at Bradford, Pa., Salamanca, N. Y., Kent, O., Marion, O., and Hammond, Ind.

In order to accommodate the new and heavier locomotives to be used, all the round houses are to be enlarged so as to give a uniform depth to the "stalls" of 95 ft., an average increase in depth of about 10 ft. The new turn-tables to be installed at each round house will be 80 ft. in length, this enlargement being made necesary also by the increased size of the locomotives. New round houses of 10 stalls each are to be built at Hammond, Ind., and Marion, O., one of 15 stalls at Port Jervis, one with 14 stalls at Kent, O., and one with 6 stalls at Bradford, Pa. Each house will be provided with new ash handling and coaling plants and enlarged cinder pits. Turn-tables are to be electrically operated in all of the yards, and yards and houses are to be lighted by electricity. The round houses, machine shops and other buildings to be erected are to be heated as a rule with a practical hot-air and ventilating system, and all appliances whether for working purposes or for the comfort and convenience of the employes are to be of the most modern type.

FIG. 5.—THE 52-IN. SAW.

Machinery for building steel freight cars on a large scale is being placed in the Jeffersonville, Ind., plant of the American Car & Foundry Co. Heretofore this plant has not constructed steel cars. An order for 650 steel cars from the Santa Fe railroad has already been received.

A PROMINENT FIGURE IN THE MACHINERY TRADE.

Brief reference was made last week to the death of E. McC. Davis. We append a fuller sketch of his career:

Edwin McCalla Davis, secretary of the Niles-Bement-Pond Co., died at his residence, No. 412 West End avenue, New York City, on May 17. The immediate cause of his death was nervous troubles from which he had been a sufferer for about a year and a half. During all that time, however, he gave considerable attention to his duties, and with the exception of brief visits in search of health in localities near New York, spent much of his time at the offices of the company.

Mr. Davis was born in Philadelphia on Nov. 21, 1861. His technical education was secured at the old Polytechnic School in his native city, which was afterwards merged in the University of Pennsylvania. After graduating as a mechanical engineer, he entered the employ of the William Sellers & Co., but not long afterwards became the chief Eastern salesman of the Niles Tool Works Co., filling this position seven years. When this company was absorbed in 1899 by what afterwards became known as the Niles-Bement-Pond Co., Mr. Davis was made secretary of the latter. He had supervision of all the company's various sales departments, and in addition had sole charge of all business in machine tools with railroads. He had a very extensive acquaintance, and this, coupled with a fine personal presence and genial manner, made him easily one of the most popular men in the trade. There was no man more approachable, and none with a finer sense of the interests of all with whom he came in contact. His death is mourned by a large circle of friends. Mr. Davis is survived by his wife.

The general balance sheet of the Nova Scotia Steel & Coal Co., just published, shows the following comparison: Assets, 1904, $12,406,050; 1903, $10,879,149; 1902, $9,675,101.

THE PROPOSED COURT OF PATENT APPEALS.

BY E. J. STODDARD, L. L. B.

The United States is divided, territorially, into nine circuits, each having its own "Circuit Court of Appeals." To fully establish one's right in a patent, he must obtain a favorable decision from each of these courts. This involves at least eighteen suits. If one of said court sustains the patent and another holds it void, as has happened, the title to the patent is good in part of the United States and void in the rest.

At the last session of Congress, it was proposed to establish a "Court of Patent Appeals," which should take all of this class of litigation instead of leaving it to the nine territorial courts. Thus giving a speedy final determination of one's rights and possibly diminishing the cost of litigation by 80 or 90 percent, in that one appeal will be sufficient to finally settle the title. The desirability of such a court seems evident.

The great social importance of the applied sciences, the magnitude of the interests involved, and the peculiar nature of the subject matter, demands a system calculated to give prompt and decisive results, and a court capable of defining and administering the law so as to secure the greatest possible degree of certainty and reliability in the title to this class of property.

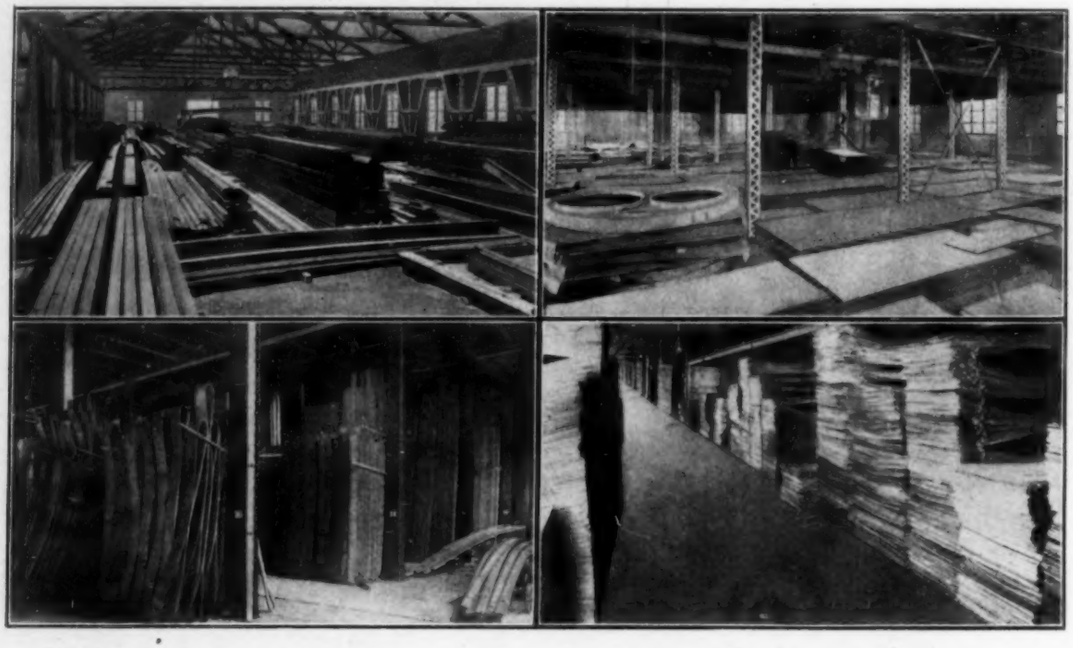


FIG. 6.—PART OF THE STRUCTURAL STORAGE.
FIG. 8.—VIEW IN 16TH STREET WAREHOUSE.

FIG. 7.—THE MAIN PLATE FLOOR.
FIG. 9.—AN AISLE ON GALVANIZED SHEET FLOOR.

A court has remarked that in our patent jurisprudence, questions of law and mechanics are inextricably interwoven. It consists in the application to engineering of the methods of the law. It is more properly a branch of engineering than of law.

The Supreme Court of the United States said in 1877:

"It would, perhaps, be desirable, if all cases of this sort could be referred to a commission of intelligent experts and practical men to report their opinion thereon, with their reasons, for the final action of the Court." . . . "Neither courts nor ordinary juries are perfectly adapted to the investigation of mechanical and scientific questions."

Mechanical and scientific questions are now much more difficult to deal with than they were in 1877.

The object of the law is to secure to each inventor just what he has invented or discovered, and not to permit him to monopolize what is not new; to promote and not to impede the progress of the arts and sciences. To distinguish what is new from what is old implies an understanding and comprehension of what is new and what is old. This is the knowledge necessary to the engineer, and it is said that only one having actual practical experience, to make his knowledge realistic, can have such knowledge. But in determining what is new and what is old certain rules have been established by the decision of the courts, rules which are effective when understandingly administered. But one does not understand a decision he has read unless he understands the mechanism, apparatus or process involved, and the utility of the decision as a precedent consists in its analogy to new cases that may arise. Whether or not it is analogous and to what extent is a question obviously calling for an educated judgment. The precise question and subject matter will not be involved a second time.

Yet these questions requiring the very ripest scientific mechanical, or engineering knowledge have been largely left to a class of men having, as a class, but little knowledge in this line and this little generally superficial. Is it any wonder that the leading engineers and scientists are complaining of the administration of the patent laws?

In the establishment of a court of patent appeals this should be remedied. It should be made up in part of lawyers and in part of a man, or men, of scientific learning and prominence in the engineering profession. The judgment of the court should be the aggregate judgment of its constituent members and would be wiser than could be obtained from any one class. In the interest of the public professional pride or prejudice should be disregarded, and men appointed who are best calculated to secure the desired end.

When a patent case is presented to a court it is by experts in the first instance, one or more experts upon each side and having their judgment somewhat influenced in favor of their respective employers. It is then presented by the counsel upon each side in briefs and arguments.

The court is to judge in each case upon the evidence, which consists mostly in the presentations of the experts,—expert testimony. But the value of each expert's opinion and the soundness of his reasoning must be estimated. If a witness is evasive in his answers, or if he appears well informed when matters advantageous to his side are considered and ignorant

Mr. Stoddard, of Detroit, was a member of the Juries of Awards for automobiles, and for marine exhibits, at the World's Fair, St. Louis. He is the author of a work on gas engine design and specializes in patent causes.

when matters favorable to the other side are spoken of, this ought to bear on the value of his testimony. And the court must decide, even when a witness is skillful in concealing his evasions, only a man learned and experienced in the applied sciences would be entirely competent to judge of the proper value to be put upon an expert's testimony in every case.

In the presentation of this class of cases experience has shown that it is desirable to have both experts and lawyers. Shall we not learn from this experience when we shall establish a court of patent appeals? Surely at least one of the judges should be an engineer. His knowledge and character will have an educating influence upon the lawyers, and the lawyers upon him. That one class would have an undesirable prominence and influence is not to be apprehended. It has not worked so.

A single court of patent appeals would very greatly diminish the cost of establishing the title to property in inventions and discoveries. The value of such property would thus be increased.

If a court of special knowledge and ability in this line should be secured it would increase the value of such property in making titles more certain and definite. I suppose it will be taken for granted that the court would be made up, at least in the greater part, of lawyers, and there would seem to be no just reason why it should not be made up in the minority (at least) of scientific and practical men and many reasons why it should be thus constituted.

We have just ended a century of wonderful scientific achievement. More has been accomplished in this line than in all previous ages of the world put together. The patent laws are also now about one hundred years old. This would seem to approve the policy of such laws.

How much of the wealth of the world is due to science? Certainly enough to attract the attention and admiration of all mankind. What effect has this wonderful epoch of history upon our intellectual and social status? This has not as yet been fully defined, but that it has had a great and predominating effect is universally recognized.

In the introduction to the "Short History of the English People," the widow of John Richard Green said:

"It seemed to him that after 1660 literature ceased to stand in the forefront of national characteristics, and that science, industry, and the like, played a much greater part."

So James Bryce in the introduction to "Studies in History and Jurisprudence" notes that "The current of study and education is at present setting strongly towards the sciences of nature and it effect," and Frederick Harrison in "The Meaning of History" speaks of the hope of modern times as:

"An era of true knowledge, of real science, and practical discovery; but, above all, an era of active industry for all, of the dignity and consecration of labor, of a social life just to all, common to all, and beneficent to all."

Prof. John Perry dismisses with scorn the idea that any one could deny that a new thought and meaning to life had been born into the world.

It is eminently proper that science and the arts to which the new promise of the development of mankind is due, should see to it, that the dignity and social rights of its members are not ignored, and that the door to a position of social dignity, to a position of direct influence in the forming of customs, and the establishing of its social rights, should not be closed to its numbers. Especially where such customs and rights pertain directly to science and the arts.

Science has won itself social recognition by the slow and difficult method of deserving it. It was not more than a hundred years ago that there was a popular outcry because the mayor of a Scotch city so far forgot his dignity as to personally welcome the members of the Royal Institute, yet there is no institution in the world that has done more for mankind, and last year the prime minister of England was honored in presiding over its meeting. Men are better, wiser and more kindly than formerly, the aggregate judgment is calmer, juster and more rational.

In the introduction to "Euclid, His Life and System" Thomas Smith, D. D. LL. D., says, that

"Euclid has exercised a mighty influence over the thoughts and lives and destinies of mankind—an influence the more remarkable because it acts not on the passions and affections, nor directly on the interests of men, but on their minds as distinguished from their hearts, and operates on these minds not with a stimulant, but rather with a sedative power. Even so, for 'God hath chosen—things which are not, to bring to naught things that are.'"

It is not only the duty of scientific and practical men toward their profession to see that it is recognized, but it is their sacred duty to mankind to keep alive, and make more universal the spirit of health that they have introduced.

The moral influence of the inspiring hope held out by a just patent law has been recognized by our courts, for example, in a recent case Judge Brawley says:

"It is this stimulus that has made the American mechanic the most alert, observant and studious of any in the world. The protection and hope of profit held out by our patent laws inspire that stimulating energy which leads to experiment, invention and all the resulting benefits. A refusal of that protection in a proper case will deaden and destroy it."

As customs and modes of thinking change we must change our institutions to correspond in order that they remain effective. Lawyers, with conventionality at the very foundation, and of the very essence of their profession, are but ill adapted to conduct such a change, but they are precisely adapted to secure the element of steadiness, but for the initiative we must introduce another element.

The engineers, scientists and practical men comprise the obvious class from which the new element should be selected.

Have we been too slow in changing? The frequent open, deliberate and shameless attempts to impose upon the public may indicate a growing spirit of cynicism and distrust. It is thought that it is Herbert Spencer that says:

"All evil arises from the non-adaptation of constitution to conditions."

The establishment of a court of dignity of such a composite character would have a secondary influence of wide scope.

It would require a more thorough and complete scientific or mechanical knowledge among patent lawyers. They must talk sense if they expect to be listened to. The character of the profession as a whole would be raised by imposing more serious and exacting duties. The path of the pundit and fakir would be more obstructed. The rewards of the profession would seem less attractive to the indolent who wish to depend more particularly on social influence or backing or even brazen effrontry.

It would bring their social obligations and duties more closely to the attention of engineers. It has been said that this is needed. A comprehension of the general principles of our jurisprudence would perhaps be thought to be a part of the necessary mental equipment of every educated engineer. And to the members of both of these professions it would prove an inspiration as affording a legitimate object of ambition.

The Simpson Iron Co., Columbus, O., has assigned to John F. Fergus for the benefit of the creditors. Assets were given as $17,000, consisting of $10,000 in real estate and $7,000 in personal property.

At a recent meeting of the Columbus Machine & Foundry Co., Columbus, O., the following officers were elected: President, W. C. Richards; E. T. Moore, vice president; A. Frederick, superintendent, and E. Hight, secretary. Directors: W. C. Richards, W. T. Moore, Jos. Donoghue, Walter Weaver and A. Frederick.

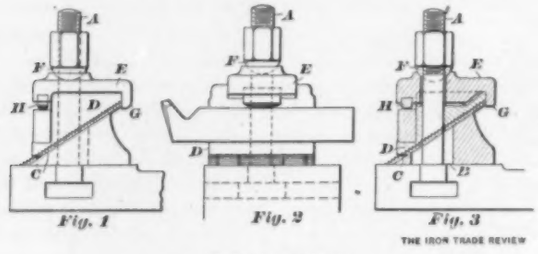
Robert S. Moore, for 25 years with the Risdon Iron Works, and John T. Scott, for 10 years with the Union Iron Works, have purchased the National Iron Works, of San Francisco, from Marschutz & Cantrell, and have already taken possession. The plant under the new management will make a specialty of marine repairs and continue the business formerly conducted.

Some New Things for the Shop, Chiefly by Way of the Patent Office.

Tool Post Improvement.

In this device, the inventor, Charles W. Grant, of Painted Post, N. Y., proposes "to provide a simple, durable, inexpensive, and easily operated tool post, which shall be so constructed as to enable the operator to utilize to the fullest extent the distance between the top of the slide rest and the lathe center, will permit a great range of vertical adjustment, will hold the tool rigid in a perfectly horizontal position, so that the tool cannot possibly slip down under the heavy cut, as is frequently unavoidable when the tool is held by frictional engagement, especially when cutting standard threads, which will provide a tool seat having an open side, so that tools with large ends, such as forming tools, may be readily inserted and removed, and which will permit convenient universal adjustment of the tool seat and tool, while retaining the latter rigidly in the horizontal position."

Fig. 1 is an elevation of the tool post with tool clamped in position for use. Fig. 2 is an elevation as seen from the left in Fig. 1. Fig. 3 is a vertical section corresponding with Fig. 1. The slide rest has a recess for the head of a bolt A and has a slot to receive a hub on the bolt. The base of the tool post has a slot at B to allow it to be adjusted according to the length of the slot. The upper surface of the base has an incline C and at the mid-width of this is a slot and there are ribs having teeth parallel with the incline. The tool rest D has a hole for the bolt and at the top has a depression for the



A NEW TOOL POST.

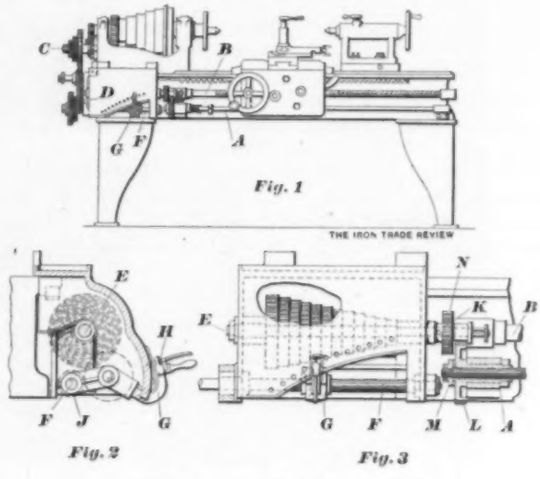
clamping member E. There is an incline on the under side of the tool rest corresponding with the incline C on the base. At the center of the tool rest and on the under side is a rib which lies in a channel on the base. The clamping piece has a round faced washer at F. At the rear of the clamping member is a tail piece G engaging the rear face of the tool rest. This acts as a stop for the clamp, prevents endwise movement and protects the channels in the base and tool rest from dirt and chips. The forward end of the clamp has a hardened steel grip at H. The grip has a rounded serrated face to engage the top of the tool, the tool rest having a suitable ledge to support the cutter.

The open side of the tool post permits any style of tool to be inserted or removed without difficulty. The round faced clamping washer at F insures the presentation of a good bearing surface to the nut irrespective of the shape or size of the tool. It will be noticed that the hole in the tool rest is placed well toward the front and brings the pressure effectively on the tool which is always held horizontally.

Gearing for Engine Lathes.

Albert E. Newton has patented a change speed gearing which is here illustrated as applied to the engine lathe built by the Prentice Bros. Co., of Worcester, Mass. The inventor has directed his efforts to the production of an improved change speed gearing of suitable form for economical manufacture and installation and which would be conveniently handled to actuate the feed rod or the lead screw. Fig. 1 is a front elevation of an engine lathe with the improvement in position. Fig. 2 is a cross sectional view, on an enlarged scale, through the gearing, and Fig. 3 is a front elevation, partly in section, of the change gear box and connections. Fig. 4 is an engine lathe with gear box complete.

The lathe carriage may be actuated by the usual feed rod A or may be driven by the lead screw B when screw cutting. There is a bearing in the rear end of the headstock for the shaft C and this is driven from the spindle through the usual tumbler gears arranged for the handy reversal of the shaft. There are three gears fastened to the shaft C and there is a sweep D having a transverse slot fitting a bolt threaded into the end of the lathe bed. The sweep can be turned about its supporting hub and fixed in any position to which it is adjusted. By this means an intermediate gear can be put in mesh with any two of the six gears shown and this forms a very convenient arrangement for a three speed connection and avoids the use of an interchangeable set of gears at this point, the change being made with gears already in position for the purpose. As will be noticed, the intermediate gear need be no greater in width than any of the six gears with which it meshes.



ANOTHER QUICK SPEED CHANGE GEAR.

A countershaft E carries a series of gears. On the shaft F is a forked lever G, and between the arms of the latter is a pinion J with a key engaging the keyway cut in F. An intermediate gear in mesh with the pinion, is journaled on the stub extending between the parts of the forked lever G. The end of this lever is turned upward and is provided with a handle. A pin H is fitted in the ear extending from the lever and is controlled by a spring pressed trigger carried by the handle. A cover plate is secured to the bed to form a box over the change gears and the front lower edge of the plate, as illustrated in Fig. 3, has a guiding rib supporting the pin H. A series of holes is bored in the cover plate and in line with the gear wheels. The forked lever G and the pinion J can be slid along the shaft F and opposite the proper gear the handle may be lifted and locked in place by means of the pin H.

The end of the countershaft E projects through the right hand journal and has a keyway cut in it. A slip pinion K is fitted on this projecting end and has a key engaging the keyway. A gear N is on the end of the lead screw B. The gear L has a hub fitted in the bearing supporting the left hand end of the feed rod A. The gear L is provided with clutch teeth to match teeth on a clutch M arranged at the end of the rod A. A spring normally keeps the toothed parts in contact. An adjustable collar on the feed rod enables the carriage

to be automatically stopped when a predetermined point in the travel is reached. The slip pinion K on the end of the countershaft E can be adjusted to engage either the gear N on the lead screw or the gear L that actuates the feed rod.

The step gearing on the countershaft E permits the same change speed gearing to drive the feed rod or the lead screw and that when either member is in use the other is idle. The arrangement of the countershaft E and the shaft F allows them and their gearing to be assembled on the bench. The lead screw and the feed rod can be applied to the machine by bolting the brackets which support the lathe to the bed. Then the supporting bracket is put in position so that the triple gears will come in the same plane with their mates and that the countershaft E will be in line for the engagement of the slip pinion K with either gears M or N.

T-Bolt Improvement.

George R. Lang, of Cincinnati, has invented a T-bolt which the G. R. Lang Co., of that city, is putting on the market. This bolt is for use on planers, boring mills, and other machine tools. It is customary to clamp the work upon machines of this character by bolts having heads passing into T-slots in the surface of the bed. When a different size or class of work is substituted for the one previously used, these bolts are changed and then the hunting for new bolts of the proper length consumes much time. When bolts of the proper length are not on hand new ones have to be forged and threads cut on them. The purpose of the patentee is to abridge these delays and do away with the necessity for forging the bolts at frequent intervals. This is accomplished by the use of a removable head for the bolt, which can be used with any length of bolt and does not have to be renewed.

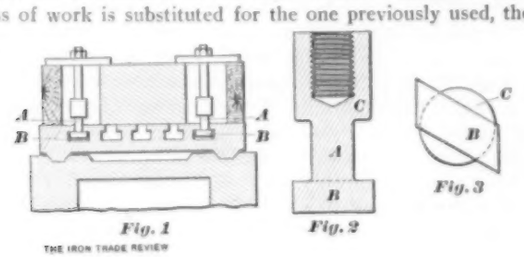


Fig. 1 *Fig. 2* *Fig. 3*

THE IRON TRADE REVIEW

RELATIVE TO T-BOLT READINESS.

Fig. 1 is a transverse sectional view of a planer bed equipped with the new T-bolts. Fig. 2 is a longitudinal section through one of the removable heads and Fig. 3 is a bottom view of the head. The bolts themselves are of very simple construction, with a thread on each end. The T-head A is provided with an angular projection B to pass into the slots in the bed from the top and to lock itself with a half turn. It is also provided with a projection at the other end, as at C, having a tapped opening for receiving the lower end of the bolts. By forming the T-head in the manner shown in Fig. 3 it can be inserted in one of the slots without removing the chips from the entire slot. When the work is changed and a bolt of different length is required, it will not be necessary to employ other T-heads, but merely the removal of the bolts from them and the substitution of bolts of appropriate lengths. In case bolts of the proper length cannot be found it is a simple matter to take an ordinary piece of round bar iron or similar stock and turn the threads on it so that it will answer the purpose. The T-heads are preferably made of steel so that they will stand a great deal of wear. It is easy to make bolts of any length required, there is no trouble about slipping the heads into the T-slots, the work can be clamped through cored holes where it would be impossible to get an ordinary T-head. The plan proposed demands little space and the contrivance has all the advantages of the common bolt employed for the purpose.

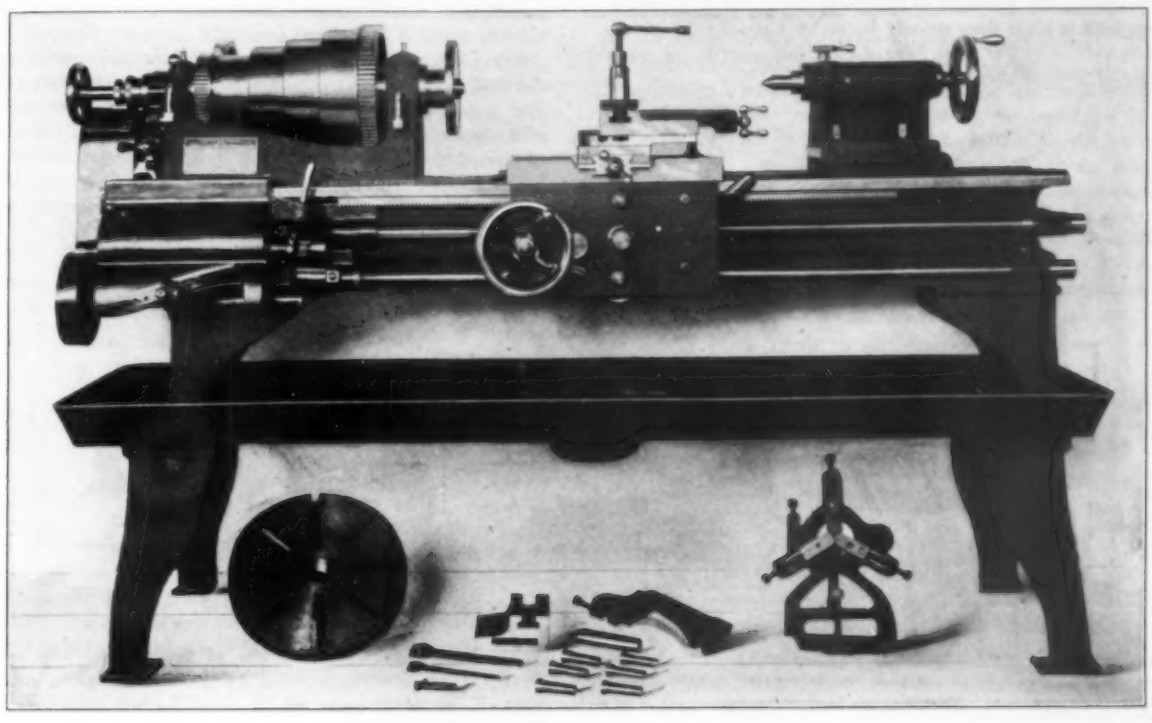


FIG. 4.—PRENTICE LATHE WITH NEW CHANGE GEAR.

The Art of Uniting Metals.

According to the declaration of a recent patent the art of uniting metals has been enriched by certain new and useful improvements devised by Wilson L. Fenn and John W. Conway, of Hartford, Conn. This invention comprises improvements in the process of fusing together two or more metals, one of which is relatively thin, and particularly when the thinner metal fuses at a lower point than the metal with which it is united. The method is here illustrated as applied to the production of cast iron cylinders for air cooled gasoline

and other engines. The principal object in this case being to provide the cylinders with thin projecting fins, preferably of sheet copper, for increasing the heat radiating surface of the cylinder.

Fig. 1 is an end view showing in transverse section a fragment of an engine cylinder having fins of sheet metal fused to it. Fig. 2 is a side view of a portion of one of the fins. Fig. 3 is a sectional end view of a fragment of the mold into which the cast iron is poured and shows some of the sheet metal fins in position in the mold. In making air cooled cylinders, particularly for automobiles, it is necessary to secure these fins firmly into the cylinder on account of the jarring to which they are subjected. It is therefore desirable to fuse them into the cylinder rather than to hold them in by pinching or a similar mechanical means. The difficulty in fusing them in place arises from the fact that the heat of the molten body of the cylinder is high enough and by reason of its usual bulk holds long enough to melt off the enclosed base of the strip, disintegrating the structure of the metal and if the strip continues to hold it all it does so only by an area equal to its thickness as though it had been brazed edgewise against the outer surface of the cylinder.

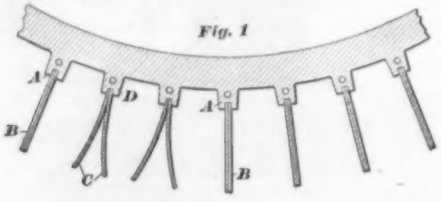


Fig. 1

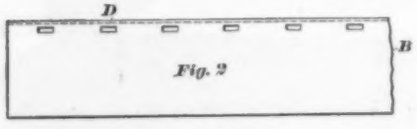


Fig. 2

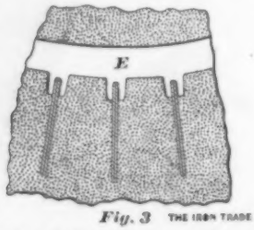


Fig. 3 THE IRON TRADE REVIEW

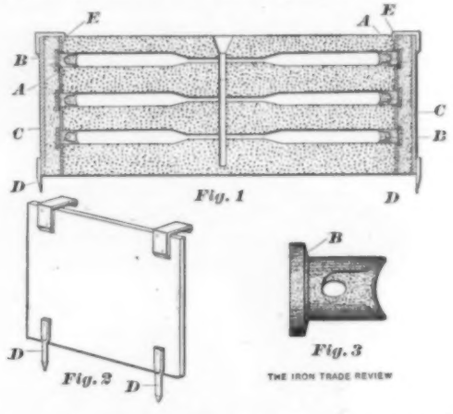
METALLIC UNIONISM IN THE FOUNDRY.

In the present invention the fins are seated in ribs projecting from the main body of the casting and proportioned to retain the heat long enough to secure fusion between the casting and the strip without melting off the base of the strip. The outer surface of the cylinder has ribs at A to receive the bases of the fins B. The projecting ribs A chill much more quickly than the greater mass of the cylinder wall and they are to be so proportioned that they begin to chill as soon as the fins are properly fused to the ribs. The fins here illustrated are doubled on themselves and extend lengthwise of the cylinder. When doubled in this manner, the strips may be separated afterward on their ends, as at C, and thereby increase the radiating surface. As a further means of insuring the retention of the fins in place they are provided with a row of holes D near their folded base portion. The surface of the sheet metal could be corrugated for the same purpose. Fig. 3 shows a portion of the mold ready for the casting of the cylinder seen in Fig. 1. The space E receives the body of the cylinder wall and the projecting ends of the fins B extend into the recesses formed for the ribs. In practice, the inventors say, it has been found convenient to place the fins in the pattern before the latter has been placed in the flask. After that the sand may be rammed into place and the pattern withdrawn leaving the fins in position as shown.

The Molding of Sash Weights.

The production of sash weights may from the very cheapness of the manufactured article be fully as interesting and possibly more generally useful from certain commercial points of view than some more elaborate molding system of much greater pretentions. Then, too, it is a matter of some interest as to the possibilities of novelty in so well traveled a field of invention. However that may be in the abstract, it has not deterred J. E. Price, of Chattanooga, Tenn., and he has obtained patent office protection on "New and Useful Apparatus for Molding Sash Weights." This invention refers to the formation of the molds in which such weights are cast, one of the principal objects of the invention being to improve the appearance of the eye and cores and prevent the formation of fins or sharp projections which would tend to cut the sash cord "and which ordinarily result from the use of metallic chills such as are commonly employed in the manufacture of sash weights." It is further proposed to provide a mold where provision is made for some slight yielding of the mold when the hot metal is introduced.

Fig. 1 is a sectional elevation of a sash weight mold showing the flask and eye cores arranged in accordance with the patent. Fig. 2 is a perspective view of one of the end boards used as a support for the core members. Fig. 3 is a perspective view of one of the eye cores. In sash weight manufacture the pat-



A RECENT EFFORT TOWARD THE COMMERCIALLY PERFECT SASH WEIGHT.

terns extend through the walls of the flasks. The sand is rammed around the pattern and after the gates and the other parts of the mold are properly formed the patterns are withdrawn through the ends of the flask and metallic chills are introduced to form the cord attaching eye at the end of the weight. The construction of the eye end of the weight requires the metallic chill to be made in two pieces and as a result a fin is produced at the eye and if this is not dressed away by hand it will tend to cut the cord. Hand work on the castings is objectionable on account of the expense.

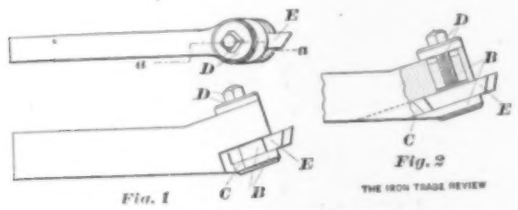
The present plan involves a flask of the usual character with apertures at A for the patterns. After the sand has been rammed and the patterns subsequently withdrawn, an eye piece B is inserted through each of the openings and projects into the mold. The eye cores have an outer flange limiting the extent of the movement. When the metal is poured into the mold there is danger of the cores being forced from their original position and where chills are used they are ordinarily confined by rigid locking bars, etc. This method of fastening them would not be practicable with baked sand cores here contemplated, as these might be broken under pressure of the metal. In order to secure the cores in place, therefore, an auxiliary plate as in Fig 2, and as at C in Fig. 1, is employed at each end of the flask. These plates have pointed spurs D at the lower edges, the spurs being forced into the floor at some distance from the end of the flask. There is a clip for each of the removable cores and the end plate E and the board

D are held a specified distance apart. Between the two is rammed the sand to hold the cores in place and form a more or less yielding backing for them. They can then move slightly under the action of the metal but without danger of breaking. After the metal has cooled somewhat, the flasks are lifted by jacks or hoist and the cores broken, leaving the sash weights in the sand.

Lathe Tool Holder.

A lathe tool holder has been patented by James Carr, of Carr Brothers, Syracuse, N. Y. This holder comprises a straight shank with a rotatable tool holder disposed at an angle other than a right angle with the bar or shank in order that the cutter will afford a shearing cut upon the work turning in the lathe. The tool holder can be rotated and the angle of the tool changed for right or left hand work and still maintain the tool in a vertically inclined position with its cutting edge uppermost.

Fig. 1 shows plan and side elevation of the tool holder. Fig. 2 is a sectional view taken on the line a-a of Fig. 1. The shank of the tool holder has a head with a circular opening at A and disposed at other than a right angle with the shank. A tool holder B is journaled in this opening and at the lower end has a head, and has a transverse slot moveable into and out of registration with a slot C in the shank and head. The tool holder B is inserted in the lower end of the opening A in the head and is of slightly less length, the head forming the lower wall of the central slot firmly engages the lower face of the tool and impinges the upper face of the tool against the upper wall of the slot C. A clamping screw D is inserted in the upper end of the opening A and is engaged with the threaded socket, the enlarged portion of the screw being adapted to engage the upper face of the head to hold



PERTAINING TO TOOL HOLDER INVENTION.

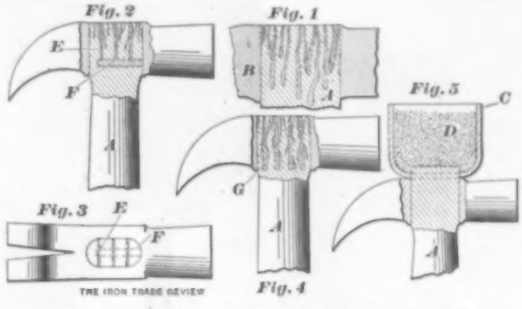
the screw from moving inward and at the same time to grip the tool E between the lower end of the holder and the upper wall of the slot C. The central slot in the tool holder is of just sufficient size to receive the tool E and permit its free endwise movement for withdrawal or insertion when the clamping bolt D is loosened. The slot C extends through the front and sides of the head and is continued downwardly and rearwardly through the bottom of the shank and tools of different lengths may be employed and may be placed at different horizontal angles with the shank. The inventor has designed several forms of this device but the one selected for illustration is probably fairly representative of the others.

Hammer Handle Security.

Alfred W. Cochran, of New York, intends to give handles a firm grip on the hammers or other tools to which they may be attached. His method "consists, primarily, in forcing metal in a molten or liquid condition into that portion of the handle which lies within the socket of the tool, thereby holding the tool and handle securely together. Stated in a more specific manner, the metal is caused to permeate the pores of the wood and to congeal or solidify therein, a metal which expands when cooled being preferably employed. The invention also includes the formation of relatively small or capillary openings in the handle, which are additional or supplemental to the natural openings or pores in the wood and increase the amount of surface exposed to the action of the metal, said small openings being by preference of special form to insure the proper retention of the handle within the socket."

Fig. 1 is a sectional view of the hammer head and handle, the latter "impregnated with metal which has been forced into its pores and become solidified therein." Fig. 2 is a similar view showing a modification of the invention. Fig. 3 is a plan view of the head and handle seen in Fig. 2. Fig. 4 is a sectional view depicting a still further modification and Fig. 5 is a sectional view of a handle and head with a cup for holding the metal as it is forced into the handle. In carrying out the invention, the handle A is inserted into the socket of the tool B and a cup C so placed that the metal D will completely cover the projecting end of the handle. This projecting end of the handle is subsequently removed. The metal is melted and *sufficient* pressure applied to force the molten metal into the pores of the handle. The inventor suggests the use of an alloy which expends on cooling. In Figs. 2 and 3 small openings E are formed at the end of the handle, the passages being connected by a channel at F. This scheme is further elaborated at G in Fig. 4 where the metal enters wedge shaped slots.

The inventor offers further assurances as follows: "It may be pointed out that when wedges are inserted into the end of a handle, as is commonly done, the friction produced in driving the same to place causes the sides of the openings formed by their passage to become smooth, which in time aids in loosening the wedges, while with my invention the pressure employed forces the small particles of metal into the surfaces of the openings, which are thereby roughened, and when the metal has hardened is will be found that the same is firmly secured in place. Instead of employing the cup shown in Fig. 5 a depression may be hollowed out in the projecting end



SOMETHING BY WAY OF ACCIDENT INSURANCE.

of the handle for receiving a sufficient quantity of metal, which may be heated and forced into the pores of the handle, as before described, the projecting end containing the cup-shaped depression being afterward removed. It is also conceivable that the molten or fluid metal might pass into the pores by gravity or, in other words, filter in."

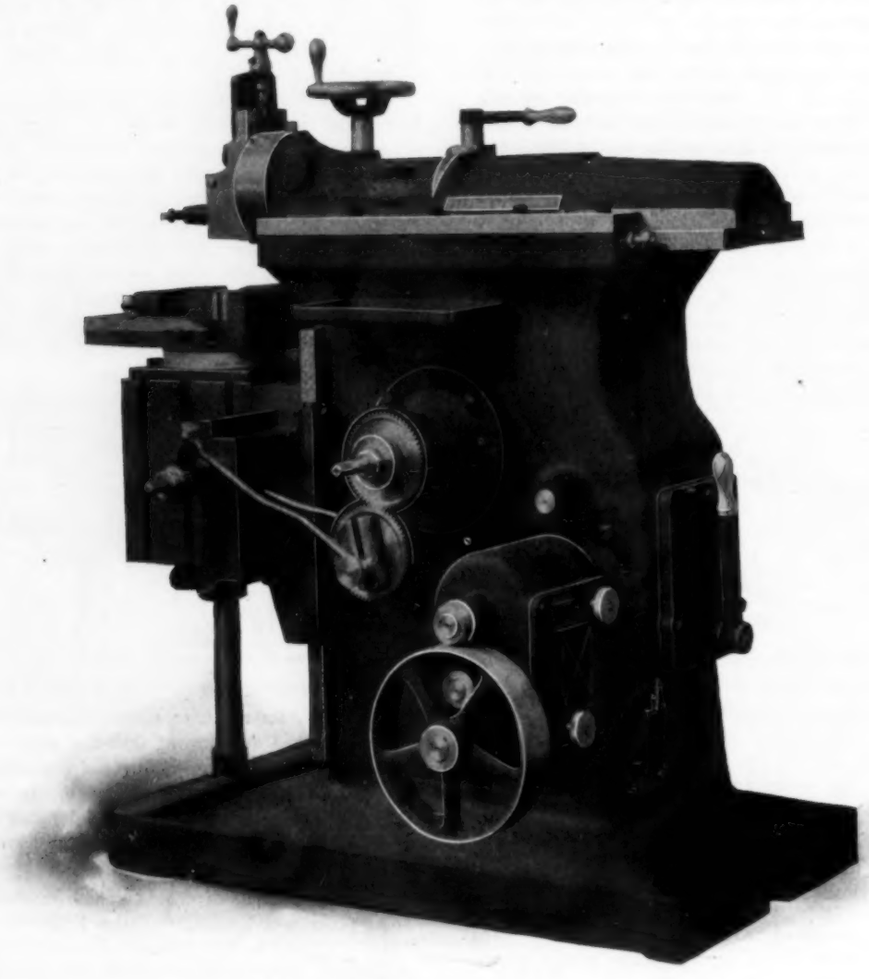
M. K. Northam, of Chicago, has purchased the La Porte, Ind., plant and holdings of the Edwards Railroad Electric Light Co., of Cincinnati, manufacturers of locomotive electric headlights, as a result of foreclosure proceedings. The purchaser represented holdings of $50,000 worth of bonds and he will reorganize the company and continue the operation of the plant.

A syndicate composed of M. S. Sonntag and other Evansville, Ind., business men have purchased the plant of the Evansville Foundry Association and will continue operations under the firm name of the Advance Stove Co. Geo. Dauble, who was manager of the old company, will remain as manager.

At the recent annual meeeting of the Angola Furnace Co., Angola, Ind., the following officers were elected: President, D. L. Guilfoyle; vice president, W. M. Fanning; treasurer, A. M. McLellan; secretary and manager, G. E. Crawford.

SHAPER WITH CHANGE GEAR DRIVE.

The standard 16-in. back geared crank shaper of the Cincinnati Shaper Co., of Cincinnati, it depicted here with gear-box attached. The cone pulley is discarded on this machine and the gear box is applied in its place. The gear box is shown as applied to a 16-in. machine but can be as well attached to any of the back geared crank shapers of this make and provides all changes of speed attainable through the usual cones. The gear box has the further advantage of affording a larger area of belt contact at all speeds without changing the belt. The aim of the designers has been in the direction of the greatest simplicity and strength, cutting out all complications which would render the mechanism liable to become complicated. In the gear box are three shafts, two of which carry sliding gears. The hand nuts shown in the illustration move readily and lock these gears at the requisite positions for speed changing. The white lines on the back of the gear box illustrate the position assumed by the lock nuts when the different combinations of the gearing are made. The box can be attached to any of the Cincinnati Shaper Co.'s crank shapers at any time though it is preferably done while the machines are in process of construction.



THE 16-IN. CRANK SHAPER WITH NEW GEAR BOX.

The general features of the standard machine made by this firm may be summarized as follows: The column is of unusual width and depth, is ribbed and braced internally, of a form to resist the peculiar strains to which it is subjected, and the horns projecting at the front and back give an unusually long bearing to the ram. The ram has a wide and long bearing in the column. The rail is deep, heavy, ribbed horizontally and strongly gibbed to the column, and the cross traverse screw is provided with a graduated collar reading to .001 in. There are felt wipers between the column and the rail. The head swivels to any angle and is graduated; the locking device is simple, and the down feed screw is provided with a graduated collar, reading to .001 in. The journal of the main gear has two diameters, overcoming any tendency to break at the junction to the gear. The crank block is a steel forging and is set well into the cup of the gear, permitting the rocker arm to travel close to the edge of the gear; avoiding the usual overhang. There are full length taper gibs throughout, adjustable endwise by single screws; namely, for the ram, head, rail, apron and crank wheel slides; affording metal contact on both sides of the gib. The cross feed connecting rod is automatically adjustable to any height of the rail, and is not dependent upon frictional contact. An outer support, as shown, is regularly furnished with each machine, without extra charge. This has two conditions, one a base stiff enough to withstand the thrust put upon it, the other that the surface the support rolls or slides on is truly parallel with the travel of the table. Ball bearings are provided under the elevating screw to the rail, and the screw, of telescopic form, never receding below the floor, is out of the way of falling chips. The vise is of improved double screw form, has a graduated swiveling base, and permits straight or tapering pieces to be securely clamped with equal facility and with rapidity. Its jaw plates are of annealed tool steel. Key-seating of shafting and of similar work up to three inches in diameter, is provided for by an opening through the column

under the ram. All material entering into the construction of the machine is of the highest class. All shafts are of high point carbon steel,, all are accurately ground and all shaft bearings are long and well braced in the column. All gears and tee slots are cut from the solid; all flat sliding surfaces, as well as the surfaces between the apron and the table, are hand scraped to surface plates. All pinions are of cast steel, and all bevel gears are cut from the solid bar. The rocker arm is strong and heavy. Means are provided for compensating for wear. The length of stroke is changed from the working side of the machine, and its position by means of a hand wheel on top of the ram, and these changes can be made while the machine is in motion or at rest.

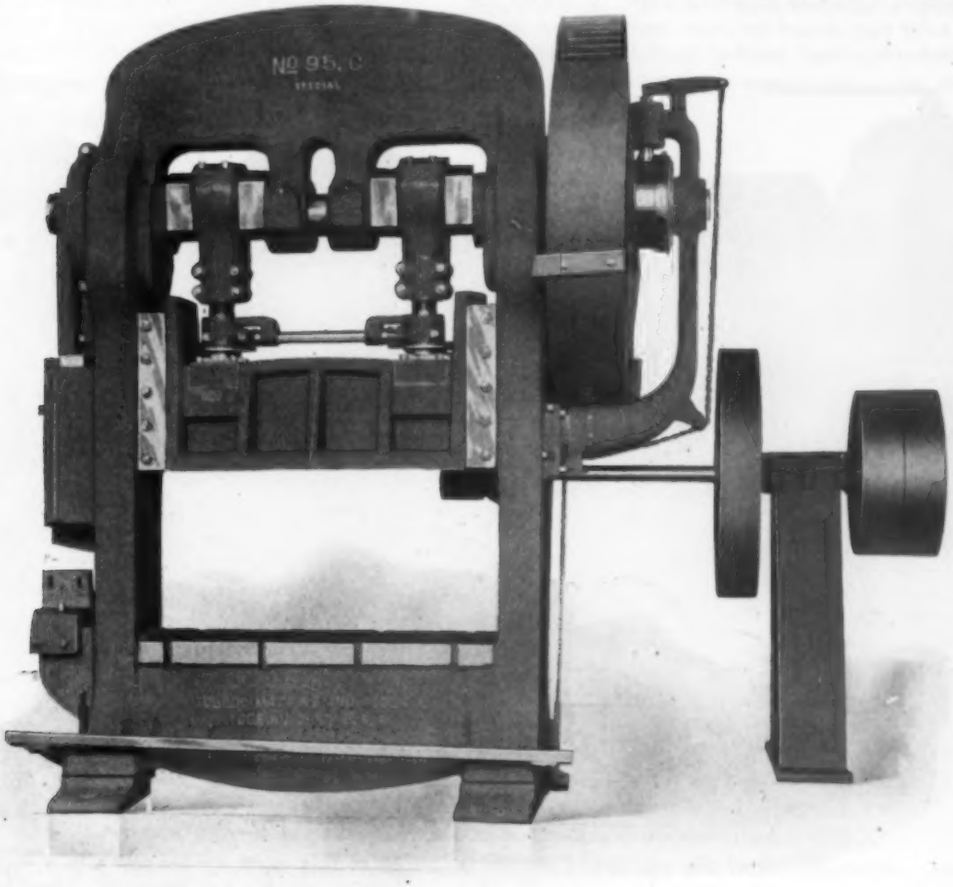
According to United States Consul Fee at Bombay, India, a projected iron industry is being organized in India by the successors of Jametjee Mtata, known as "The Merchant Prince of Bombay." It is reported the syndicate will have a cash capital of $6,500,000 for the purpose of manufacturing iron to renew the rails on the long lines of road in India and supply growing demands for structural iron and steel.

The Chicago Hardware Foundry Co., of North Chicago, Ill., has increased its capital stock and will use the funds secured in the sale of treasury stock in increasing the size of the plant.

A special meeting of the stockholders of the Central Iron & Steel Co., Harrisburg, Pa., has been called for July 20, for the purpose of taking action on the proposed increase of the company's indebtedness for the addition of new extensions. The new open hearth department, recently installed, has proven highly satisfactory.

THE TOLEDO FORGING PRESS.

This press is one of thirteen sizes built by the Toledo Machine Tool Co., of Toledo. The press here illustrated is of the extra heavy double geared straight sided double pitman pattern; the stroke or slide motion being 7 in. The slide or ram is fitted with an adjustment of about 5 in. and is adaptable to dies or work with a considerable variation in height. The screws and crank shafts are made of high carbon hammered steel. The gearing is machine cut from the solid. The press is fitted with an automatic block clutch with patented gravity controlling or releasing device, and the operator has the machine completely under control at all times. The distance between uprights is 60 in. and the distance from bed to ram or slide, 36 in. The press is fitted with an outer slide for shearing or cutting off tools with special holders for shearing tools furnished of an unusually solid construction. The press bed is solid and made as close to the floor line as possible in order to bring the working height of the dies in the most convenient manner possible for the operator. This press has a capacity for forging 30 lb. sledges and is adaptable to a wide range of work for various purposes.



A NEW FORGING PRESS.

The Railway Steel Spring Co., Chicago, has declared the regular quarterly dividend of 1¾ percent on the preferred stock, payable June 20. Books close June 9 and reopen June 21.

Jefferson, Tex., has been suggested as a good location for a cotton tie mill, being the center of a district which produces one-half the cotton crop of the south.

WIELAND 20-INCH PIPE MACHINE.

The machine is built on modern machine tool lines and has all gear speed changes. The bed is cast in one piece. There are no separate legs nor spindle stands to be strained out of line. All journal boxes are a part of the bed casting. The base of bed forms a pan for oil drippings. The die operating mechanism has no connection whatever with the adjusting screw. Grooves cannot be gouged across the threads with this mechanism, for the chasers are withdrawn from the pipe the moment the lever is raised. The cam ring has an opening opposite each chaser which allows the passageway to be cleaned without removing the ring. None of the chasers can drop out of place. The chasers are unusually deep, and will cut a full thread on any kind of pipe at one cut. Those for 20-in. pipe will, when new, cut a perfect thread or screw end 2⅞ in. long. This is of advantage in several ways: It enables the cutting of a full taper thread for heavy fittings tapped deeper than standard—the Briggs' standard 20-in. thread being only 2.60 in. long; and it also allows the entrance of chasers to be ground when necessary and still leave enough depth for a standard thread. The face ring through which screws pass to bear it against the front of the chasers, has a patented interlocking ring fitting into a recess in the bore of die-head which prevents chips from passing into the cam ring. The die head is of flexible or floating type in accordance with the pipe mill practice. Rounding-up blocks are supplied, there being a pair for each size of pipe for which chasers are furnished. When pipe is out of round the upper block is, by means of the hand wheel, forced into the pipe causing it to round out to the circular shape of the blocks. The blocks also act as steady rests for the pipe while it is being cut off. The cutting tool slide is gibbed so that any wear may be readily taken up. One cutting-off tool is furnished. The independent cluck jaw frames contain renewable tool steel teeth. The jaws of both front and rear chuck project beyond the face of the chuck shells; this makes it possible to grip short nipples in the front chuck and to screw flanges onto pipe with power by holding them in the rear chuck jaws. The spindle speeds six in number, are obtained by machine-cut steel shifting gears driven by a single speed pulley. The driving belt is never touched by the operator's oily hands, and therefore retains its maximum driving power for a longer time than is possible where it is necessary to shift a belt on a cone pulley. The speed changes are made by levers at the operator's side. Machine belt is 5 in. double. The builders have discarded the slow-acting shifting belt countershaft and have adopted the friction clutch pulleys as increasing the output of the machine by being more quickly operated. A rotary pump attached to the machine delivers the oil to both die-head and cutting-off tool.

The machine is built by the Standard Engineering Co., of Ellwood City, Pa., and has adjustable expanding cutters for 10 to 20-in. pipe.

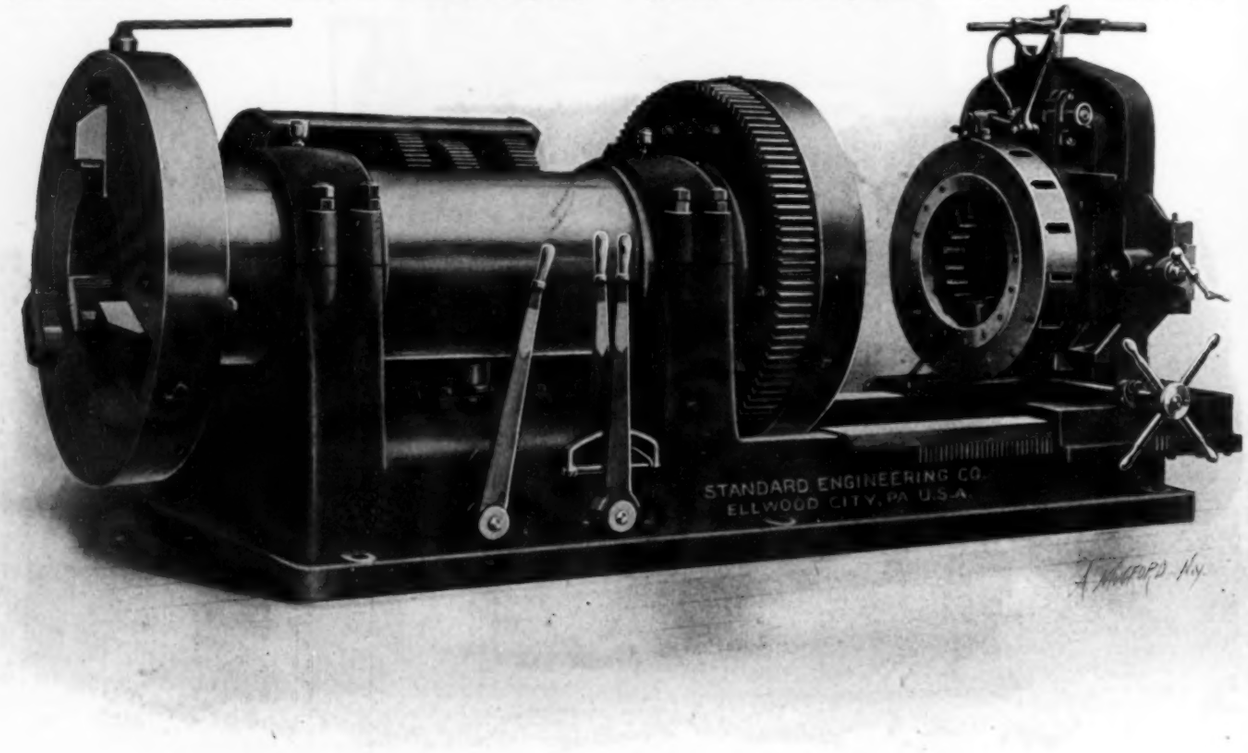


FIG. 1.—STANDARD WIELAND 20-IN. PIPE THREADING AND CUTTING MACHINE.

The Thurlow works of the American Steel Foundries, Thurlow, Pa., recently completed a steel casting weighing 90,760 pounds, and measuring 12 ft. 2 in. square at the base, 8 ft. 5 in. by 10 ft. 5 in. at the top and 3 ft. 9 in. high, to be used in building pier No. 1 of Blackwell's Island bridge spanning East river between New York and Brooklyn. In order to complete the order 31 more such castings will be made.

The Mason Heater & Foundry Co., of Bellaire, O., is placing its plant in condition for operation and will manufacture heaters and do a general foundry business. The following officers have been elected: John Futhey, president; John Schick, vice president; T. C. Nicholson, secretary; C. A. Smith, treasurer, and L. W. Gilcher, manager.

The Philip Carey Mfg. Co., Cincinnati, O., has placed a representative at Houston, Tex., and proposes to carry a full stock of 85 percent magnesia standard asbestos and other pipe and boiler covering, asbestos materials, roofing and roofing paints. The company will have an office and wareroom at Houston as soon as a suitable location is found. Other branches located are at Dallas, Tex., and Little Rock, Ark.

KELLY FOUNDRY & MACHINE CO. EXPANSION.

The deal heretofore referred to by which the Kelly-Foundry & Machine Co., Goshen, Ind., takes financial interest in the Tallerday Steel Pipe & Tank Co., of Waterloo, Ia., and LeMars, Ia., and the Tallerday Mfg. Co., of Dolgeville, Cal., has been consummated. Mr. Tallerday was at one time in the employ of the Goshen company. He was the originator of the first galvanized steel tank, which that company manufactured and put on the market. Later he went West and established the factories at Waterloo and LeMars, Ia., and for the benefit of his health he later went to Dolgeville, Cal. His health being benefited there and the Iowa plants being in charge of his son, H. G. Tallerday, he organized the Tallerday Mfg. Co. at Dolgeville. The Iowa and Indiana plants have for a number of years been engaged in the manufacture of galvanized steel tanks, tank heaters, feed cookers, culvert pipe and other similar lines. Realizing the great advantage of being able to make shipments direct from the four different points, thereby saving buyers freight and also enabling the companies to make much prompter delivery of the goods, the above arrangements were perfected. It is the intention to make the different goods as manufactured by the different plants uniform so that orders can be filled from any of the four places.

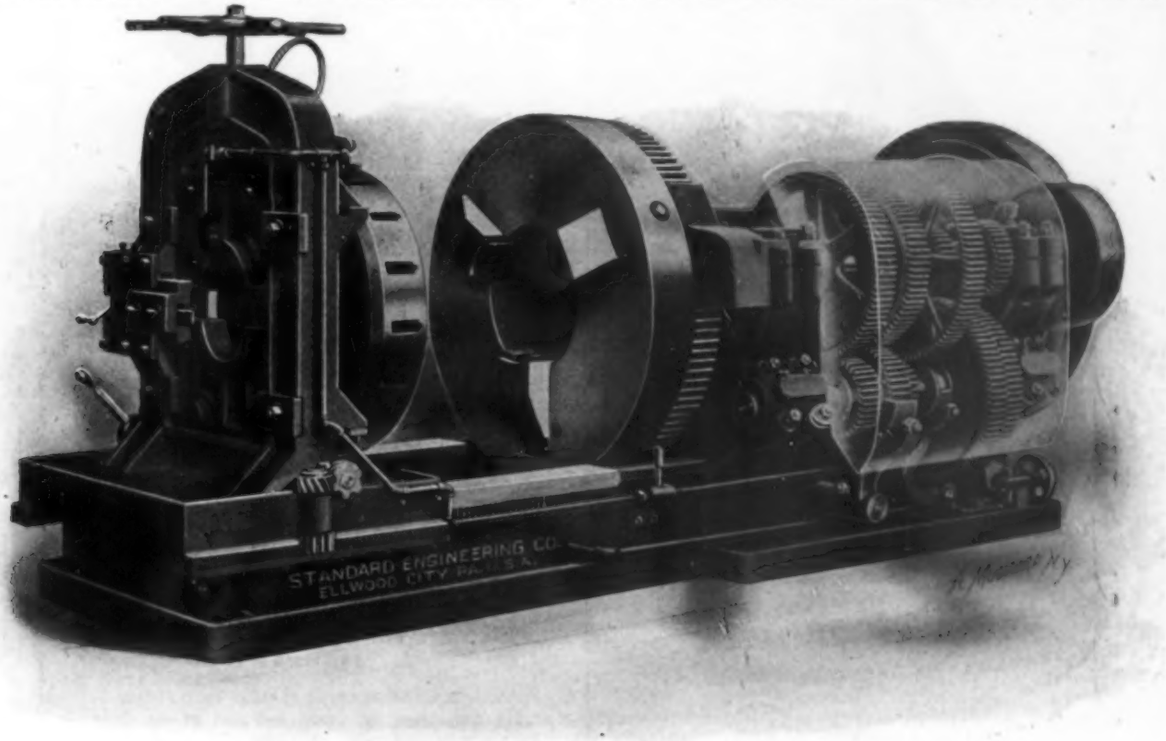


FIG. 2.—REAR VIEW OF PIPE MACHINE. COVER REPRESENTED IN PHANTOM TO ILLUSTRATE GEARING.

American Radiator Co. in Canada.

The American Radiator Co. has recently acquired the foundry plant of the Cockshutt Plow Co. at Brantford, Ontario. The company will rapidly remodel these works with a view to making therein suitable lines of ideal steam and water boilers, for which a good demand already exists throughout the Dominion, largely due to extensive advertising. The company will not for the present manufacture radiators there. The continually expanding unity in commercial affairs now developing between the states and the provinces, and the similarity of demand and trade conditions all combine to justify the expectation that the American Radiator Co. can make the broadest application of its title and policies on Canadian soil, as well as it is doing in the United States.

RHINELANDER POWER CO'S PLANT.

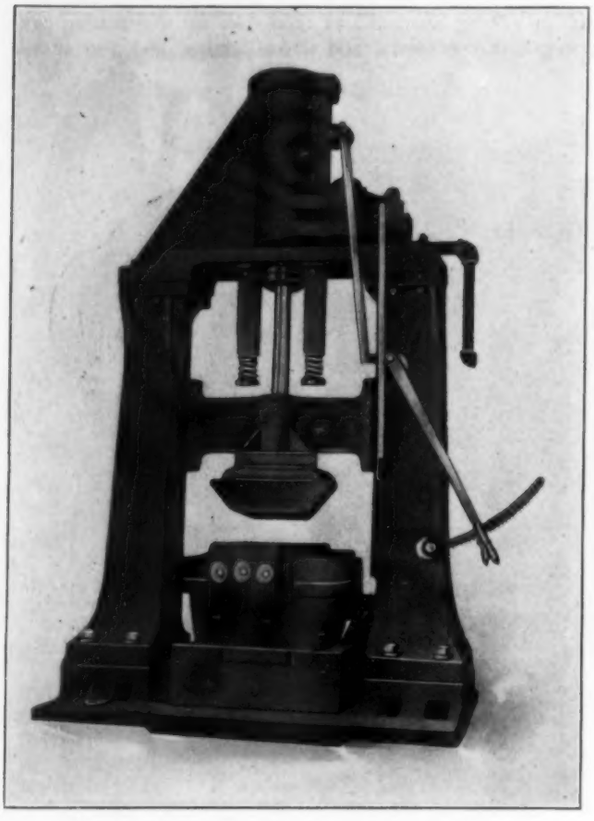
The Rhinelander Power Co., of Rhinelander, Wis., composed largely, if not entirely of local parties, has completed arrangements to develop the water power of the Wisconsin River at a point about six miles below the city of Rhinelander. A dam will be built giving a head of about twenty-four feet, and sufficient water is obtainable to develop an average of about 600 h. p. In the rainy season more than 2,000 h. p., at a conservative estimate, is obtainable. The Allis-Chalmers Co. will furnish the entire electrical equipment, which includes three 400 k. w. 1,100 volt three-phase, 60 cycle generators, with three 70½ k. w., 120 volt separately driven exciters, six 150 k. w., 10,000 volt transformers and complete switchboards at both the generating station and the sub-station at Rhinelander. The current will be carried at 11,000 volts over a single three-phase circuit to the sub-station at Rhinelander, a distance of about six and a half miles, and from this sub-station will be distributed at 1,000 volts for illuminating purposes, both commercial and street lighting, and also at 440 volts to the mill of the Rhinelander Paper Co. and other industries in the neighborhood of the sub-station. This plant is one of the first long distance transmission plants on the Upper Wisconsin River. It is expected that many more enterprises of a similar character will be undertaken in that region within the next two years.

Richard Eccles Co., Auburn, N. Y., has been recently incorporated and succeeds the business established by Richard Eccles in 1880. The business was incorporated with a capital of $100,000 and will manufacture the same line of goods as heretofore, carriage and wagon forgings and special drop forgings.

The Vulcan Iron Works Co., of Toledo, Ohio, has shipped one of its popular "Little Giant" steam shovels to the Northern Mines Co., Ltd., of Atlin, B. C., where it will be used in placer work. Rochussen & Collis, of Victoria, B. C., handled the sale.

A SPECIAL STEAM HAMMER.

This machine has been specially designed for forming steel wheelbarrow trays and drag scrapers and is built by the Lane Tool Co., of Cleveland. That class of work has been done on very crude machines which in most cases have been constructed by the manufacturers of such sheet steel products. In forming work of this kind it is necessary to heat the sheets and clamp to the die in order to form a smooth tray. Usually the clamping has been done by hand and very slowly, consequently the sheets would get cold before the trays were pressed into shape. The builders of the machine under consideration have placed a self-contained clamping device on the anvil. This contrivance is operated by compressed air and instantly clamps the sheets to the lower die and then with four or five light blows of the hammer the trays are formed very quickly. Where formerly eight to ten men were required



STEAM HAMMER WITH AIR OPERATED CLAMP TO DIE.

to do this work by arduous and awkward labor, only three men with the present tool are necessary to heat the sheets and shape the trays. The hammer has a distance of 52 in. between the uprights, weighs about 22,000 lb. and is suitable for the formation of all sizes of wheelbarrows and numbers 1, 2 and 3 drag scrapers.

Arrangements have been completed whereby the Fair-Williams Bridge Co., of Ottumwa, Ia., passes into the hands of Henry Phillips, of the Ottumwa Car Loader Co. The old company was capitalized at $60,000, but this will be increased. Officers of the new company are: Henry Phillips, president; Samuel Mahon, secretary and treasurer, and these with W. E. Hunt, directors.

The Iron City Sanitary Co., Pittsburg, is enlarging its plant at Zelienople, Pa., by the erection of a two-story brick building, 75 x 175 feet.

FUEL OIL FURNACE.

The E. W. Bliss Co., of Brooklyn, N. Y., has added a new department and is now prepared to equip complete drop forging plants. One of the latest innovations in this line is the oil burning furnace here described. The furnace has been designed from the shop experience of many years. It is built to avoid the wasteful use of oil. The best service with this furnace is obtained by using air as the atomizing agent under pressure of 15 to 20 lb., as the heat can be regulated to a greater nicety. If tool steel is being forged, a slow fire is necessary to avoid overheating or burning the stock. If soft steel or iron is used, the heat can be readily raised to a higher degree without injury and an increased output obtained. The installation of a compressor is somewhat expensive, and on account of this, if the forging plant is a small one, a very good substitute can be made by using a pressure blower giving air at say, one pound pressure. The Bliss furnace is suitable for either pressure, the only difference being in the burner.

THE BLISS FUEL OIL FURNACE.

Oil as a fuel is much cheaper than anthracite coal; it avoids the annoyance of ashes and dirt in the shop; it heats faster than coal and as the heat is uniform the danger of injury to the material by burning is minimized. Another great economy in the use of oil fuel is that when the forge is no longer wanted the closing of the valve instantly stops expense, whereas with coal fuel the bed of live coal is daily wasted.

In front of the furnace a perforated pipe is placed directly under the opening. The holes in this pipe are small and run the entire length of the opening, and as streams of air are constantly flowing through the holes it serves to keep the heat within the furnace, and also acts as a cooling agent for the operator when removing heated bars and in replacing them. The furnace is made in four sizes. The opening and the interior in all furnaces are of suitable size to avoid wasteful use of oil, but at the same time heat the material so quickly as to enable the forger to work constantly.

Conditions in the iron molders' strike against the Minneapolis Steel & Machinery Co., Minneapolis, Minn., made it necessary for the company to call police protection. While no violence has taken place, pickets were stationed around the plant and the company is taking no chances.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers :—

William Allen Sons Co., proprietors of the Worcester Boiler Works, Worcester, Mass., has been incorporated with a capital stock of $25,000. The officers are: William Allen, president; Herbert M. Dodge, vice president; Walter B. Allen, treasurer; William G. Allen, mechanical engineer.

The American Marine & Locomotive Equipment Co., New York City, has been incorporated to manufacture locomotive and marine equipments; capital stock, $1,000,000. The directors are: C. O. Harms, Summit, N. J.; M. M. Loewenthal, Felix Muehlenthal, Abraham Lindheim, Samson Loewenthal, all of New York City.

The Hurley Mfg. & Supply Co., St. Louis, Mo., has been incorporated to manufacture and deal in railway appliances, mill supplies, etc. The incorporators are: L. S. Flateau, T. J. Hurley and Charles H. Sawyer. The capital stock is $10,000.

The Automatic Door & Gate Co., New York City, has been incorporated, with a capital stock of $50,000, to manufacture elevator doors, other doors, gates, etc. The incorporators are: William B. Roe, William J. Carey and Walter C. Low, 346 Broadway, New York.

A. B. Subers and Henry Banks Jr. have incorporated The Subers Co., with $15,000 capital stock, to conduct a plumbing and sheet-metal works.

The Foote Axle Burr Co., Marshall, Mich., has been incorporated with a capital stock of $100,000, of which $13,500 has been paid in. The company will manufacture the axle burr of which Dr. F. M. Foote is the inventor.

The Standard Concrete Steel Co., Yonkers, N. Y., has been incorporated by J. F. Havemeyer, W. B. Nisbet and G. B. Wait, all of New York. The capital stock is $500,000.

The Ohio Iron & Brass Bed Co., Eaton, O., has been incorporated by Elam Fisher, D. J. Miller, Wilson Royer, C. W. Royer and Homan Royer. The capital stock is $50,000.

The Cincinnati Foundry Co., Cincinnati, O., has been incorporated with a capital stock of $10,000. The incorporators are: John W. Schwoever, P. A. Schwoever, L. C. Ultrick, John D. Berger and W. H. Bowers.

The Bessemer Foundry & Machine Co., Bessemer, Ala., is making arrangements to install $20,000 worth of new machinery in its plant, the large orders which the company is constantly receiving making it necessary to increase the capacity of the plant.

The Federal Cartridge Co. filed articles of incorporation in New Jersey May 22. At the office, No. 10 Wall street, New York, of Frank Z. Maguire of London, one of the incorporators, it was stated that the new company is capitalized for $2,000,000, and contemplates the immediate erection of a manufacturing plant at Norwalk, Conn. It is intended to equip it with the most modern machinery and tools for a capacity equal to the largest of the kind in this country. It will employ when finished about 1,000 hands. In addition to providing for the requirements of a large and increasing domestic and foreign demand for sporting ammunition, particular attention will be given to military business as well, and on a scale to rival any plant now in existence for supplying our own and other governments. Among the incorporators are: Henry S. Thompson, New York city; E. J. Hill, of Connecticut; Cyrus C. Baker, Newark, N. J.; E. J. Kingsbury Jr., president of the Bridgeport Brass Co., Bridgeport, Conn.; R. Jay Walsh, Greenwich, Conn.; Lyman E. Warren, attorney, New York city, and Frank Z. Maguire, London, England.

Fires :—

The entire plant of the North Wayne Tool Co., North Wayne ,Me., was destroyed by fire May 24. The loss is about $35,000, nearly covered by insurance. The company will not rebuild, but will locate at some point where the railroad facilities are good.

Fire destroyed a large part of the factory of the Akron Machine Co., Akron, O., May 19. It is thought the loss will amount to about $40,000.

The roundhouse of the Union Station Co., Savannah, Ga., was completely destroyed by fire May 18. The building was valued at $3,000, about half of the loss being covered by insurance. The tools and signal apparatus contained in the building were worth about $5,000.

New Construction :—

Contracts and specifications have been drawn up for a new plant to be added to the plant of the Akron Selle Co., additions to be about one-half as large as the present buildings.

The Morgan Engineering Co., Alliance, O., proposes to erect a new addition to its shops, to be used for office purposes. Aside from the general offices, provision will be made for the drafting department, fire-proof vaults for the safekeeping of drawings, correspondence and a large reception room. The new building will be connected up with the shops by means of a tunnel on Bay street.

Plans of the contemplated stove and furnace plant which Innes & Demarest will build at Binghamton, N. Y., have been completed. As soon as they are approved, the contract will be given at once in order to allow of the completion of enough of the building to accommodate 100 men.

The Salem, O., plant of the American Steel & Wire Co. will be closed for a short time in order that improvements may be made. These improvements call for the erection of a new carpenter and blacksmith shop and additional warehouse space.

The Western Tube Co., Kewanee, Ill., has advertised for bids for the erection of a large addition to the main office building.

The Brylgon Steel Casting Co., New Casle, Dela., is building two ovens in addition to the three now in operation, and will shortly build two more.

The Goeller Iron Works, Newark, N. J., will soon erect two brick and iron structures, each two stories. One will be used for an office and the other as an iron works.

La Compagnie Desjardins, St. Andre, Ont., has already commenced to rebuild the plant destroyed by fire April 25. The buildings and machinery will be of the most modern types. The foundry and machine shop will be 160 x 56 ft., one story, and the woodworking shop 210 x 50, two stories. They are so arranged that additions may be made without altering the form of the buildings. This company manufactures extensively threshing machines operated by horsepower known as the Canadian Champion, as well as buck boards, wagon trucks and machinery for small saw mills and flour mills.

The Mitchell Boiler & Iron Works, Mitchell, S. D., have commenced work on their new machine shops. The buildings are to be equipped with the most modern machinery.

The Choley-Drewrey Iron Works, recently organized at Carrollton, Ga., have constructed a new brick shop building, are installing machinery and expect to be in operation within a few weeks. They will do a general furnace and machine shop business.

The Columbus Forge & Iron Works, Columbus, O., have constructed additions to the forging department and doubled the capacity of the plant.

The Carver File Co., of Philadelphia, with a fully paid in capital of $100,000, has been incorporated under the laws of Pennsylvania and the new plant will include two buildings each 40 x 170 ft., with a capacity of 900 dozen files per day. In the formation of the company the plant of the D. B. Murphy File Co., of Camden, N. J., was absorbed and will continue independent operation on special light files, all other grades being made at the new plant. The new plant at Philadelphia

is already under roof and will begin operations about August 1.

The marine department of the Maryland Steel Co., at Sparrow's Point, Md., has been given the contract to build two steel seagoing car floats for the New York Central & Hudson River railroad. These floats will be 260 ft. long, 40 ft. beam, and similar to those which the same company built some years ago for the New York, Philadelphia & Norfolk railroad. The contract calls for delivery before Dec. 1.

The plant of the Three Rivers foundry, Three Rivers, Mich., has been greatly increased and the office has been moved to a new building. The change became necessary by reason of the increasing business.

Representatives of the Oak Hill Foundry & Machine Works, Oak Hill, O., have been at Guthrie, Okla., to look over a site for a new plant. The present proposition, as is understood, is to move the Oak Hill plant to Guthrie and spend about $20,000 in new construction.

The American Engineering Co., Indianapolis, Ind., has closed a contract with the Huntington, Columbia City & Northwestern Traction Co. for the construction and equipment of the proposed lines of the latter company from Huntington to Goshen and eventually to South Bend, Ind. The contract represents work to the value of about $1,500,000. Preliminary surveys will be started in about two weeks.

General Industrial Notes:—

The Mexican Car & Foundry Co., at Hutchinson, D. F., four miles north of the City of Mexico, has already spent almost $220,000 in construction and equipment and is pushing the work with vigor. Machinery and electrical equipment is now being installed and the company expects to start within a few weeks.

A meeting of the stockholders of the Flannery Bolt Co., Pittsburg, will be held on July 15, to consider a proposition to increase its capital from $200,000 to $300,000.

The contract for the construction of the connection between the St. Clair Terminal Railroad at Clairton, Pa., and the West Side Belt line of the Wabash railroad has been awarded and the line will be completed this summer. The construction of this connection will give the Wabash a portion of the tonnage of the Clairton plant of the Carnegie Steel Co., and another connection is to be built to the Union Railroad which connects the Homestead and Duquesne plants of the Carnegie Steel Co. at Homestead and Duquesne, Pa.

At the annual meeting of the Orient Coal & Coke Co., held at Pittsburg last week it was decided to erect 100 additional coke ovens. The company now has 300 in operation. Officers were elected as follows: Julian Kennedy, president; Robert Bentley, vice president; Reid Kennedy, secretary and treasurer, and O. W. Kennedy, general manager. The company is capitalized at $1,400,000.

Heavy Orders Received.

Mackintosh, Hemphill & Co., Pittsburg, builders of rolling mill machinery and engines, have recently received a number of large contracts for rolling mill machinery and engines as follows: Shear to cut hot slabs 8 x 38 or 6 x 48 in. for the National Tube Co., McKeesport, Pa., and to be used in connection with the large universal mill now under construction; three pairs of twin cylinder direct connected engines for the Latrobe Steel Co., Latrobe, Pa.; 40x60-in. automatic engine for the Morgan Engineering Co., Alliance, O., to drive a rod mill now being built by this concern for shipment to Japan; 44 x 60-in. Corliss engine for the Oliver Iron & Steel Co., Pittsburg, and is also remodeling No. 1 rail mill of the Lackawanna Steel Co., Buffalo, and the heavy sheet mills of the Portsmouth Steel Co., Portsmouth, O.

CINCINNATI MACHINERY MARKET.

The machine tool business is enjoying a highly satisfactory demand and the past month has been one of the best of the year in point of orders. Foreign business has shown a most encouraging increase and domestic orders have been well distributed. Specifications from railroads have been good and the government has been conspicuous in the buying list. Some of our shops are behind in their orders and are losing business because they can not make prompt deliveries. It is becoming a problem with some large concerns as to how to distribute their product, having a choice between foreign and domestic orders. Both of these fields are desirable and it is difficult to so adjust their sales as to not favor one or the other. The business is steadily expanding in this city and added capacity, new shops increasing facilities and other features of prosperous conditions are to be noted all along the line. The shops are now running full and the activities have the look of the good old times.

It is to be noted that this general report of good and active condition covers the whole machine tool list and is not confined to any particular line. Planers, lathes, shapers, drills, woodworking machinery, engines and boilers are all participating in the satisfactory demand.

The Champion Tool Works, a new concern, with H. W. Kreutzburg as general manager, who was for seven years with the Bradford Machine Co., is building a new plant 70 x 130 ft. which will be finished by June 1, and will begin at once to put a line of lathes on the market. The sizes to be built first will be 10, 12, and 16 in. lathes and other sizes will be added later.

The John Steptoe Shaper Co., has enjoyed an increase in business the past month and has had a most encouraging run of foreign orders. These have been well distributed and came from Japan, England, and Belgium.

The Lodge & Shipley Machine Tool Co. reports a good run of business and is getting behind on some sizes under the pressure of demand and requests for early shipments.

The Cincinnati Planer Co. has had a good steady run of business for several months and reports no falling in orders and a satisfactory outlook for the remainder of the year.

Greaves, Klusman & Co. have the same encouraging report to make as others in their lines.

The Cincinnati Milling Machine Co. is adding more floor space to its large plant and is anxious to have the work pushed along as rapidly as possible, as the shop is busy and the addition is much needed to enable the company to handle the business with more facility. The company is enjoying a good demand for its machines and is looking for a big year's business.

Large Orders for Boilers.

The Simplex Railway Appliance Co. has just been awarded a contract for 20,000 truck bolsters, to be used under 10,000 cars to be built by various car companies, for the Baltimore & Ohio Railroad Co. The cars of which these Simplex truck bolsters will form a part, are all of 40 and 62½ tons capacity, including box, coal, and gondola cars. This contract represents in money, the largest order ever given to one concern for bolsters.

The Aetna Nut Co., Southington, Conn., has taken an unusual step to rid itself of labor troubles, and has decided to entirely dispense with Italian laborers. The rolling mills will not be started until this is accomplished.

The Burden Iron Co., Troy, O., without solicitation on the part of its employes, has increased wages to the rate paid prior to the reduction in 1904. The advance affects 1,500 men.

Wood Patterns for Castings.
Working Models of Machinery.

Because some other fellow did not please you is no reason we can't.
We can give you references if you wish them, from good people, too.

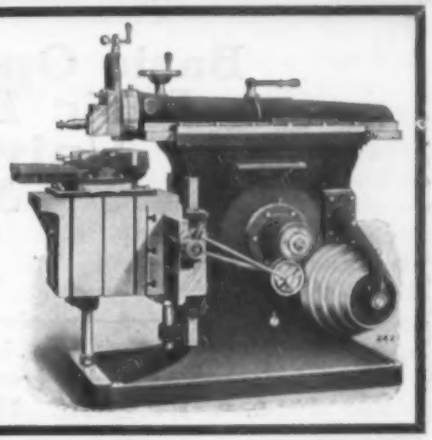
THE BALKWILL PATTERN WORKS, CLEVELAND, OHIO.

W. S. WELLMAN, Gen. Mgr.
H. C. IRWIN, Supt.

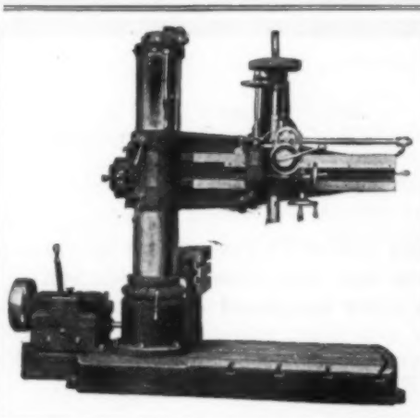
Office and Works,
1301 St. Clair Street.

HEAVY DUTY SHAPERS

A feature in our new line of back geared crank shapers not found in any other make and one of the most important recent improvements in this class of machines, is the full length taper gibs, endwise adjustable by single screw, throughout.



THE CINCINNATI SHAPER CO.
Cincinnati, Ohio, U. S. A.



RADIAL DRILLS

PLAIN RADIALS
SEMI-RADIALS
HALF UNIVERSAL RADIALS
FULL UNIVERSAL RADIALS

Our Radial Drills are made in five sizes, the center of circle capacity of which ranges from 5 to 12 feet.

THE BICKFORD DRILL & TOOL CO.
CINCINNATI, OHIO, U. S. A.
106 B

STEAM DRIVEN AIR COMPRESSORS POWER DRIVEN

ECONOMICAL SIMPLE RELIABLE

Chicago, Ill.
Cleveland, O.
St. Louis, Mo.

THE INGERSOLL-SERGEANT DRILL CO.
26 Cortlandt Street, NEW YORK.

Boston, Mass.
Pittsburg, Pa.
Philadelphia.

J 12

PITTSBURGH VALVE, FOUNDRY & CONSTRUCTION CO.
ENGINEERS, FOUNDERS, PIPE FITTERS AND MACHINISTS
STEAM PIPING FOR HIGH PRESSURE POWER PLANTS
PITTSBURGH, PA.

MESTA MACHINE COMPANY

PITTSBURG, PA., U. S. A.

Corliss and Piston Valve Engines

—FOR—

Rolling Mills, Blast Furnaces and Power Plants

Horizontal Tandem Compound Corliss Engine

Horizontal Cross-Compound Corliss Engine

ROLLING MILL MACHINERY

MACHINE-MOLDED GEARS

STEEL, SAND and CHILLED ROLLS, STEEL CASTINGS

Basic Open Hearth Steel Slabs
Basic Pig Iron, Wide Flats
Universal Plates, Pipe
Steel Cut Nails
Sheet Bars
Skelp

Every facility to insure high quality from ore to finished product.

LA BELLE IRON WORKS, Steubenville, O.

ESTABLISHED 1842. INCORPORATED 1888.

JOSEPH T. RYERSON & SON.

GENERAL OFFICES AND WAREHOUSES, CHICAGO.
EASTERN OFFICES, NEW YORK AND PITTSBURG.

Always on hand—
largest stock in America.

Sent regularly —free —if you wish it.

The placing of many orders hinges on time of delivery. Buy the iron and steel from our stock and you will have the order completed months before your competitor.

All sizes—Immediate Shipment.

QUICK SHIPMENT

often means a big saving to the buyer. Our large stocks of plates, structural steel, sheets, boiler tubes, rivets, etc., enable us to satisfy your requirements immediately. We carry all sizes in stock and can make shipment on day of order.

Write for our 150 page stock list. It is free.

SCULLY STEEL & IRON COMPANY

Chicago, Ills.